

Fleet Modernization Program (FMP) Management and Operations Manual



Volume 2

SUPERSEDES: SL720-AA-MAN-020, Volume 2, dated August 1993

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TECHNICAL SPECIFICATION

TITLE: LIAISON ACTION RECORD (LAR)

NO.: TS9090-100A

DATE: JUNE 2002

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LIAISON ACTION RECORD (LAR)

1 SCOPE

1.1 This specification establishes requirements for a formal technical liaison system among SHAPEC Activities, Planning Yards (PYs), Supervisors of Shipbuilding Conversion and Repair (SUPSHIPS), Overhaul Yards, Space and Naval Warfare Systems Command (SPAWAR), Participating Managers (PARMs), Alteration Installation Teams (AITs), Ship Program Managers (SPMs), and other organizations involved in the Ship Alteration (SHIPALT) process.

1.2 APPLICATION - The technical liaison system described herein shall be used for the following reasons:

- a. Technical Information
- b. Interpretation of Drawings, Specifications, etc.
- c. Material Identification
- d. Change Requests
- e. Planning Yard approval of Drawings

The primary document to be used in this Liaison System is the Liaison Action Record (LAR); however, it is not the intent of this specification to require the use of LARs where other mechanisms exist such as the direct liaison between the overhauling activity and the PY On Site Representative (OSR).

1.3 CHANGES - Any changes to SHIPALT drawings which affect, material specifications, pipe stress levels or distribution, system design or operational characteristics/features, component or fitting selection, ratings and MIL-SPECS, structural integrity, power requirements, compartment/topside arrangements or require insertion in drawing for follow on ships are not permitted except where concurred on by the PY. This concurrence can be obtained either via LAR or the OSR process. Where approved changes require the revision of drawings, the appropriate activity will modify these on a priority basis.

1.4 This specification does not apply to Nuclear Propulsion Plant matters under the cognizance of NAVSEA 08.

2 APPLICABLE DOCUMENTS. The following documents of the issue in effect on the date specified in the data of the tasking correspondence form a part of this specification.

2.1 SPECIFICATIONS

2.1.1 9090-600 SHIP ALTERATION DRAWING PREPARATION

2.1.2 9090-500C SHIP ALTERATION RECORD PROCESS

2.1.3 MIL-HDBK-61 CONFIGURATION MANAGEMENT GUIDANCE

2.2 PUBLICATIONS

2.2.1 NAVSEA TL 130-AB-PLN-010, Trident System Change Management Plan

2.2.2 NAVSEA 0902-018-2010, General Overhaul Specifications For Deep Diving SSBN/SSN Submarines

2.2.3 GSO (NAVSEA S90A-AB-GOS-010/GSO)

3. REQUIREMENTS

3.1 Each activity shall designate individuals to act as liaison representatives. The number of liaison representatives shall be limited to that which is absolutely necessary to maintain effective liaison while avoiding duplication of effort. The signature of an assigned liaison representative on a LAR shall signify that the record is an official communication from the activity involved.

3.2 Technical liaison services may be requested by the following form of communication.

3.2.1 A LAR shall be used to request services which are within the Scope of this specification. Each LAR shall be prepared in the standard form described in Figure 1, and meet the legibility requirements of MIL-D-5480 (paragraph 2.1). In addition to identification of the requesting activity, each shall include:

a. An action number as follows

SHIPALT	HULL	SERIALIZATION
0596/	DDG5/	0001

b. The date of the communication.

c. Complete identification of all references and attachment of enclosures necessary to define the problem. Cost and impact information should not be included in the LAR but should be provided in supplementary documentation.

d. A clear statement of the information or action desired.

e. A specific date when a reply is required. . The originator should normally allow the following reply times depending on the Priority of the LAR:

a. Immediate	3 Working Days
b. Urgent	5 Working Days
c. Routine	10 Working Days
d. Review	60 Working Days (See Tech Spec 9090-310)

f. Additional distribution shall be added to Fig. 1 as necessary to keep concerned parties informed.

g. The installing activity (Navy or Contractor) should include a recommendation for resolving the engineering data problem. The details should include information that can be readily transferred from the LAR to engineering drawings without further need to shipcheck. This information is to be included in supplementary documentation to the LAR.

3.2.2 Telephone communications may be used to request services considered urgent in nature where written communications will not provide timely support. In such cases the request shall subsequently be made and answered in writing on a serialized LAR. Phonecon memos of

record shall be attached to the LAR as a matter of record.

3.2.3 Messages may be used when services or information needed is considered urgent. A LAR action number shall be assigned each correspondence. Messages will be answered within five working days of receipt. Priority messages will be answered within three working days.

3.3 Incoming liaison inquiries should be answered by the date requested. In cases where more time is required, the addressee shall notify the originating activity of the date the answer will be provided particularly when the response will require more than two weeks. In all cases of urgent requests, the originating activity shall be notified of any delay in response immediately.

3.4 Each activity shall maintain a log of incoming and outgoing liaison inquiries and their reply status.

3.5 Each activity shall maintain a file, which contains all information, associated with each answered incoming and outgoing inquiry.

3.6 Each activity shall respond to all LARs by phonecon giving the estimated time to reply if response time will exceed that established in this specification and maintain a record of that communication. This record should contain the date of call, new response date established and persons participating in the conversation. This record shall be kept in the file required by Section 3.5 of this specification.

3.7 Questions regarding SHIPALT technical requirements will be directed to the PY.

3.8 The SPM shall monitor the LAR process by periodically reviewing the response time to LARs.

4. CHANGES AND DEVIATIONS

4.1 Minor waivers and deviations and Class II Engineering changes IAW MIL-HDBK-61 will be approved by installing activities, except for waivers or deviations from non-reactor plant, non-deviation (ND) SSN 688 and SSBN 726 Class drawings or documents.

4.2 DESIGN CHANGES - The PY in the process of developing the detail design shall request approval from the SPM for major/critical deviations or changes that affect the Technical Requirements IAW MIL- HDBK-61. The change approval request is to contain:

4.2.1 Identification of the affected NAVSEA Technical Requirements.

4.2.2 Identification of the affected SHIPALT(s) and drawings.

4.2.3 A brief description of the existing system or area of the ships configuration being impacted.

4.2.4 Reasons why it is not considered feasible or appropriate to accomplish in accordance with the technical requirement(s) for this hull or class. Full technical rationale is required.

4.3 SUBMARINE CHANGES - For SSN 688 and SSBN 726 Classes, all waivers and deviations from non-reactor plant, non-deviation (ND) SHIPALT drawings or documents shall be in accordance with ND drawing procedures for these classes as described in NAVSEA 0902-018-2010, General Overhaul Specifications For Deep Diving SSBN/SSN Submarines and NAVSEA TL 130-AB-PLN-010, Trident System Change Management Plan.

5. QUALITY ASSURANCE

5.1 Each activity using this specification is responsible for compliance with all the requirements of this specification.

5.2 Each activity using this specification may be audited to assure compliance with the requirements of this specification.

LIAISON ACTION RECORD		ACTION NO. _____ DATE _____
From: To: Subj: Ref:		
ORIGINATOR	CODE	APPROVED
Question or Action Required		Reply is Required by _____
COMPLETED BY	APPROVED BY (BRANCH HEAD)	DATE
TELE. NO.	SIGNATURE	
Answer or Action Taken		

Distribution:

Planning Yard Code _____

NSA Code _____

PEO/SPM _____

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TECHNICAL SPECIFICATION

TITLE: JUSTIFICATION/COST FORM

NO.: TS9090-210A

DATE: JUNE 2002

SUPERSEDES: TS9090-210, dated JUNE 88



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JCF PREPARATION

1. SCOPE. This specification provides criteria for the uniform preparation, processing, and approval of a Justification/Cost Form (JCF).

1.1 GENERAL. The JCF is used by the Engineering and Platform Directorates to arrive at a management decision of whether or not to proceed with the development of a Ship Alteration (SHIPALT). The document in general will define the top-level requirements and anticipated costs for the SHIPALT and, when approved and assigned a number, will serve as the authorization to initiate Ship Alteration Record (SAR) development. In accordance with FMP Milestones the JCF shall be submitted not later than A-16 for the availability of the first intended install and the SPM shall adjudicate the JCF no later than A-14. The JCF shall be completed in Microsoft Word © using the Templates found on the FMP Website (www.FMP.NAVY.MIL).

1.2 APPLICABILITY. This specification is applicable to surface ships, surface craft, and submarine JCFs and shall be utilized by all personnel for preparing, processing and maintaining Justification/Cost Forms except as noted herein (see Section 1.3).

1.3 EXCEPTIONS. This specification does not apply to:

- Nuclear Propulsion Systems under the cognizance of Naval Sea Systems Command (NAVSEA) 08,
- Special Project Alterations (SPALTs) affecting the Configuration and/or Capabilities of systems and equipments under the cognizance of the Director, Strategic Systems Programs (DIRSSP),
- Aircraft launch and recovery equipment changes under the cognizance of the Naval Air Systems Command (NAVAIR).

2. REQUIREMENTS. All of the following requirements apply to the JCF format, as shown in Figure 1. This section provides step-by-step instructions for the preparation of a JCF. The amount of detail to be provided in the JCF will depend on the complexity of the proposed change or modification and should be determined by the submitter. Figure 2 lists all of the data fields and identifies which activity is to provide the data and whether it is required or optional.

2.1 SHIPALT IDENTIFICATION. (1) This field will allow the SPM to enter the approved SHIPALT Identification Number. The SHIPALT Number will include the ship class, the number and the title (e.g. K, D, F). This number shall be in the following form: Ship Type (e.g. CVN)- Ship Class (e.g. 68)-SHIPALT Number (e.g. 8767)- SHIPALT Title (e.g. K)- Revision (e.g. 00). This field is mandatory prior to approving a JCF and can only be entered by the Ship Program Manager (SPM).

2.2 ESWBS (EXPANDED SHIP WORK BREAKDOWN STRUCTURE). (2) The ESWBS field shall indicate the ESWBS number selected from NAVSEA S9040-AA-IDX-010/SWBS 5D, which is most closely associated with the system, component, or structure being impacted by the alteration. This field is to be completed by the JCF Preparer.

2.3 SHIPALT BRIEF. (3) This data field is to be used by the JCF Submitter to enter the

Brief of the alteration. The user shall enter carefully selected words that describe the subject of the proposed change or alteration. This field shall be no more than 30 Characters in length in order to comply with the Navy Data Environment-Navy Modernization (NDE-NM) / FMPMIS Database requirements. Use standard abbreviations as required.

2.4 PURPOSE. (4) This data field will allow the JCF submitter to provide a brief description of the alteration. Include references to any other amplifying information or data, if available.

2.5 JUSTIFICATION FOR ALTERATION. (5) This data field will allow the JCF Submitter to enter a brief history of the need for this installation. This data shall be provided with reference to the activity and official document that initially requested the change or alteration. (i.e. INSURV, TYCOM, PMI, etc.). Include references to any other amplifying information or data, if available.

2.6 MATERIAL. (6) This data field will allow the JCF submitter to enter the top line system configuration identification of the Hardware Systems Command (HSC) material to be installed. The items listed in this field should be the same as those that will be listed in the P1 funding line in NDE-NM/FMPMIS.

2.7 APPLICABLE SHIP CLASSES. (7) This data field is a list of all of the ship classes that the alteration is applicable to. The JCF submitter should identify those ships or ship classes to which the change or alteration is applicable (Separate SARs will be prepared for each class of ships). If the individual ships are not noted then it will be assumed that the alteration is applicable to all ships of the class. Along with the ship class the JCF submitter will supply the intended date for the first install, availability of first unit or lead time for delivery of first unit. If there are significant differences in description, material requirements, and/or installation costs among ship classes, a separate JCF shall be developed for each class.

2.8 REQUIRED PRIOR OR CONCURRENT ALTS. (8) This data field is to be used by the JCF submitter to list any prior or concurrent alts required by this proposal. This section should include but not be limited to SHIPALTs (both approved and pending), MACHALTs, ORDALTs, Engineering Changes, Field Changes, SPALTs and Technical Directives. If the alteration is unique to a ship class and more than one ship class is identified in section 2.7 above then the ship class shall be identified for the alteration.

2.9 C5I IMPACT. (9) This field is an indication (Y/N) of whether or not the change or alteration impacts C5I systems or operation or the ship's combat systems.

2.10 DRYDOCK REQUIRED. (10) This field is an indication (Y/N) of whether or not the alteration requires the ship to be drydocked.

2.11 SUBSAFE IMPACT. (11) This field is an indication (Y/N) of whether or not accomplishment of the change or alteration impacts a SUBSAFE boundary.

2.12 DISTRIBUTIVE SYSTEMS IMPACT. (12) This field is an indication (Y/N) of

whether or not Ship's Critical Distributive Systems (SCDS) are impacted by the accomplishment of the change or alteration.

2.13 SYS CERTIFICATION. (13) This field is an indication (Y/N) of whether or not accomplishment of the change or alteration requires certification of a combat system.

2.14 TEMPEST IMPACT. (14) This field is an indication (Y/N) whether or not accomplishment of the change or alteration requires TEMPEST certification.

2.15 TOPSIDE IMPACT. (15) This field is an indication (Y/N) whether or not accomplishment of the change or alteration impacts the topside areas of applicable ships. This includes, but is not limited to, arrangement changes, changes in firing cutout zones, RADHAZ, HERO, EMI or RADAR Cross Section.

2.16 WT&MT IMPACT. (16) This field is an indication (Y/N) of whether or not accomplishment of the change or alteration impacts the weight and moment of applicable ships.

2.17 AIT CAPABLE. (17) This field is an indication (Y/N) of whether or not accomplishment of this alteration is within the capability of an Alteration Installation Team (AIT). If this field is marked as "Yes" then the installation mandays (see 2.32) should be the installation mandays required by the AIT.

2.18 SAFETY ALT. (18) This checkbox is an indication (Y/N) of whether or not the change or alteration is specifically intended to correct a pre-existing safety problem or provide a safe operating or living environment. If this box is checked then the Category Code (See 2.26) must be either a 1 or 2.

2.19 ILS AFFECTED. (19) This field is an indication (Y/N) whether or not installation of this alteration will affect Integrated Logistics Support (ILS). This will include but not be limited to any update/changes to any existing Technical Manuals, new Technical Manuals, Supply Support (e.g., I&C's, MAMs, Onboard Spares, etc.), Maintenance Index Pages (MIPs), Maintenance Requirements Cards (MRCs), Technical Repair Standards (TRSs), Class Maintenance Plans (CMPs), Intermediate Repair Standards (IRSs), any changes or additions to any existing training plan, new training plan, special tools, alignment jigs, test equipment, any changes or additions to any existing SRD's or development of new SRD's for equipment installation and certification of this alteration.

2.20 SHIPBOARD STOWAGE AFFECTED. (20) This field is an indication (Y/N) whether or not installation of this alteration will require any use of shipboard Stowages.

2.21 INDUSTRIAL STOWAGE AFFECTED. (21) This field is an indication (Y/N) whether or not installation of this alteration will require any use of industrial Stowages.

2.22 AVIATION IMPACT. (22) This field is an indication (Y/N) whether or not accomplishment of the change or alteration impacts air operations, air space, or any aviation system or facility onboard ship(s). This includes, but is not limited to: flight/hangar deck

operations; manning; aircraft and weapons stowage, movement, and handling; aviation related spaces (e.g., Primary Flight Control, Flight Deck Control, CATCC, Squadron Ready Rooms, AIMD, etc.); Carrier Suitability (e.g., airwake, ship motion, etc.); Air Traffic Control; Aviation Support Equipment and/or services. It also includes modifying NAVAIR systems or embedded ship systems affecting NAVAIR system location or performance (e.g., piping, lighting, or electrical)

2.23 ICD'S REQUIRED. (23) This field is used to indicate (Y/N) whether or not planning for this change or alteration will require the PARM to deliver ICD's and to enter the date when these ICD's will be available.

2.24 TMA/TMI. (24) This field is used to indicate (Y/N) whether or not this change or alteration is a Top Management Attention (TMA) or Top Management Interest (TMI) item.

2.25 ACAT I-IV. (25) This field is an indication (Y/N) whether or not this change or alteration will install a system that has been designated an Acquisition Category I through IV as defined in DOD Regulation 5000.2 series, (Mandatory Procedures for Major Defense Acquisition Programs and Major Automated Information System Programs).

2.26 INTEROPERABILITY ALT. (26) This field is an indication (Y/N) of whether or not the change or alteration is required for battle group interoperability.

2.27 OTHER SYSTEMS INTERFACE. (27) This field is for the JCF submitter to list any other interface to ships systems other than those covered in the Y/N check boxes above (Sections 2.9 through 2.23). This includes impacts such as Weapons storage (either temporary or permanent) or Fuel offload.

2.28 IBOM. (28) This field is for the JCF submitter to fill in the NDE-NM / FMPMIS Alteration Bill of Material Source (IBOM) Code.

<u>CODE</u>	<u>DESCRIPTION</u>
0	SOURCE OF BOM NOT SPECIFIED
1	BOM NOT YET DEVELOPED
2	JUSTIFICATION COST FORM (JCF)
3	SHIPALT RECORD (SAR) BOM
4	SHIP INSTALLATION DRAWING (SID) BOM
5	HULL UNIQUE MATERIAL
6	BOM NOT REQUIRED

2.29 CATEGORY CODE. (29) This field is for the JCF submitter to fill in the NDE-NM / FMPMIS Category Code as listed below.

<u>CODE</u>	<u>DESCRIPTION</u>
0	PRIORITY LEVEL NOT ESTABLISHED
1	MANDATORY AND SAFETY
2	RELIABILITY AND MAINTAINABILITY (PRIMARY)

3	PRIMARY MISSION SYSTEM MODERNIZATION
4	RELIABILITY AND MAINTAINABILITY (SEC) MISSION AREA
5	SECONDARY MISSION AREA MODERNIZATION
6	MISSION SUPPORT

2.30 COST INDICATOR. (30). This field is for the JCF submitter to fill in the NDE-NM / FMPMIS Cost Indicator as listed below.

<u>CODE</u>	<u>DESCRIPTION</u>
A	DETAILED COST ESTIMATE ($\pm 10\%$)
C	BUDGET QUALITY ESTIMATE ($\pm 15\%$)
D	FEASIBILITY ESTIMATE ($\pm 20\%$)
F	BALLPARK ESTIMATE ($\pm 40\%$)
X	DIRECT OR MODIFIED ESTIMATE (DIRECTED BY CUSTOMER)

2.31 IMPLEMENTATION LEVEL CODE. (31) This field is for the JCF submitter to fill in the NDE-NM / FMPMIS Implementation Level Code as listed below.

<u>CODE</u>	<u>DESCRIPTION</u>
D	DEPOT
I	IMA/TENDER
T	AIT
F	SHIP'S FORCE

2.32 MATERIAL COSTS. (32) This field is used to enter the projected cost of any SHIPALT material that is requisitioned, fabricated, or locally procured by the Naval Supervising Activity (NSA) or the Installing Activity. This should be exclusive of the Headquarters Centrally Provided Material (HCPM). The material should not be entered in this field.

2.33 INSTALLATION MANDAYS. (33) This field will be used to provide an estimated installation cost in mandays for accomplishing the change or alteration. This estimate will be Rough Order of Magnitude (ROM) estimate.

2.34 DESIGN SERVICES ALLOCATION MANDAYS. (34) This field will be used to provide an estimated DSA cost in mandays for planning the change or alteration. This estimate will be Rough Order of Magnitude (ROM) estimate.

2.35 TOC. (35) This field is used to list the estimated Total Ownership Costs (TOC) for the change or alteration. This cost should be expressed in manhours and can be either positive or negative.

2.36 PRIORITY. (36) This field shall contain the TYCOMs priority for the JCF.

2.37 SAR PREPARER. (37) This field is used to designate the activity that will be assigned by the SPM to prepare the Ship Alteration Record. The SAR Preparer will normally be the Planning Yard or the PARM. This field is to be completed by the SPM.

2.38 SAR APPROVER. (38) This field is used to designate the activity that will be delegated the authority to approve the SAR. The SPM can designate any activity as the SAR Approver for any SHIPALT (e.g. K or D). Once designated that activity has the full authority to review and approve the SAR. This field is to be filled in by the SPM.

2.39 JCF SUBMITTER. (39) This field is to be used by the JCF Submitter to enter the Technical Point of Contact (TPOC) of the JCF Submitter. This field will consist of two parts: the first is the activity of the submitter; the second is for the Name and Phone number of the submitter.

2.40 LEAD LCM. (Logistics) (40) This field is to be used for entering the logistics Life-Cycle Manager for the system or equipment being installed. This field will consist of two parts: the first is for the activity of the Lead LCM; the second is for the Name and Phone number of the Point of Contact (POC) to be entered.

2.41 ENGINEERING AGENT APPROVAL. (41) This field is to be used by the SPM to fill the cognizant Engineering Agent Lead Engineer who has primary responsibility for the alteration once engineering approval has been obtained. This field will consist of two parts: the first is for the activity of the Engineering Agent; the second is for the Name and Phone number of the POC.

2.42 SYSTEM TPOC. (42) This field is to be used by the JCF Submitter to enter the Technical Point of Contact for the system covered by the JCF. This field will consist of two parts: the first is for the activity of the System TPOC; the second is for the Name and Phone number of the TPOC.

2.43 SEA 08 CONCURRENCE. (43) This field is for the SPM to enter the Name and Phone number of the 08 POC once his/her approval has been obtained. For changes affecting nuclear propulsion areas as listed in NAVSEA Instruction 9210.4, SEA 08 concurrence is required on the JCF. This field is mandatory for the SPM to enter data. The SPM can either enter the SEA 08 POC's name with the (S) and telephone number to indicate the signature is on file or N/A for JCFs with no nuclear propulsion interface.

2.44 TYPE COMMANDER CONCURRENCE. (44) This field is for the SPM to enter the TYCOM POC once his/her approval has been obtained. This field is mandatory for the SPM to enter data. The SPM can either put the TYCOM POC's name with the (S) and telephone number to indicate the signature is on file or N/A for where no TYCOM concurrence is required. This field will consist of two parts the first is for the appropriate TYCOM or N/A the second is for the Name and Phone number of the POC to be entered.

2.45 OTHER CONCURRENCE. (45) This field is for the SPM to enter the Name and Phone number of any other organization whose concurrence is required. The SPM shall enter the activities (SPAWAR, NAVAIR) POC's name with the (S) and indicate the signature is on file. This field has two columns the first is for the concurring Activity the second is for the Name and Phone number of the POC.

2.46 SPM APPROVAL. (46) This field is to be used by the SPM to fill in the name, code, and telephone number of the cognizant NAVSEA/PEO Lead Technical Code Engineer who has primary responsibility for the alteration. This field consists of two parts: the first is for the SPM's activity; the second is for the Name and Phone number of the POC to be entered.

3. QUALITY ASSURANCE PROVISIONS. The SPM shall ensure that the JCF conforms to the requirements of Section 2 above.

4. GENERAL INFORMATION. Any additions, deletions, or changes to this specification must be made under the auspices of the FMP Conference.

FIGURE 1

JUSTIFICATION/COST FORM	
SHIPALT IDENTIFICATION: (1)	ESWBS: (2)
BRIEF: (30 Characters Max): (3)	
PURPOSE: (4)	
JUSTIFICATION FOR ALTERATION: (5)	
MATERIAL: (6)	
APPLICABLE SHIPS: (7)	
REQUIRED PRIOR OR CONCURRENT ALTS: (8)	
C5I IMPACT: (Y/N) (9)	DRYDOCK REQUIRED: (Y/N) (10)
SUBSAFE IMPACT: (Y/N) (11)	DISTRIBUTIVE SYSTEMS IMPACT: (Y/N) (12)
SYS CERTIFICATION: (Y/N) (13)	TEMPEST IMPACT: (Y/N) (14)
TOPSIDE IMPACT: (Y/N) (15)	WT & MT IMPACT: (Y/N) (16)
AIT CAPABLE: (Y/N) (17)	SAFETY ALT: (Y/N) (18)
ILS AFFECTED: (Y/N) (19)	SHIPBOARD STOWAGE AFFECTED: (Y/N) (20)
INDUSTRIAL STOWAGE AFFECTED: (Y/N) (21)	AVIATION IMPACT: (Y/N) (22)
ICD 'S REQUIRED: (23)	TMA/TMI: (Y/N) (24)
ACAT I-IV (Y/N) (25)	INTEROPERABILITY ALT: (Y/N) (26)
OTHER SYSTEMS INTERFACE: (27)	
IBOM: (28)	CATEGORY CODE: (0-6) (29)
COST INDICATOR: (A,C,D,F,X) (30)	IMPLEMENTATION LEVEL CODE: (D,I,T,F) (31)
MATERIAL COSTS: (32)	INSTALLATION MANDAYS: (33)
DSA MANDAYS: (34)	TOC: (35)
PRIORITY: (36)	
SAR PREPARER: (37)	
SAR APPROVER: (38)	
JCF SUBMITTER: (39)	
LEAD ICM (Logistics): (40)	
ENGN DIR: (41)	
SYSTEM TPOC (42)	
SEA 08: (43)	
TYCOM: (44)	
OTHER: (45)	
SPM: (46)	

FIELD AUTHORITY TABLE

FIELD	DESCRIPTION	AUTHORITY
1	SHIPALT IDENTIFICATION	MANDATORY SPM
2	ESWBS	MANDATORY SUBMITTER
3	SHIPALT BRIEF	MANDATORY SUBMITTER
4	PURPOSE	MANDATORY SUBMITTER
5	JUSTIFICATION FOR ALTERATION	MANDATORY SUBMITTER
6	MATERIAL	MANDATORY SUBMITTER
7	APPLICABLE SHIP CLASSES	MANDATORY SUBMITTER
8	REQUIRED PRIOR OR CONCURRENT ALTS	MANDATORY SUBMITTER
9	CSI IMPACT	MANDATORY SUBMITTER
10	DRYDOCK REQUIRED	MANDATORY SUBMITTER
11	SUBSAFE IMPACT	MANDATORY SUBMITTER
12	DISTRIBUTIVE SYSTEMS IMPACT	MANDATORY SUBMITTER
13	SYS CERTIFICATION	MANDATORY SUBMITTER
14	TEMPEST IMPACT	MANDATORY SUBMITTER
15	TOPSIDE IMPACT	MANDATORY SUBMITTER
16	WT & MT IMPACT	MANDATORY SUBMITTER
17	AIT CAPABLE	MANDATORY SUBMITTER
18	SAFETY ALT	MANDATORY SUBMITTER
19	ILS AFFECTED	MANDATORY SUBMITTER
20	SHIPBOARD STOWAGE AFFECTED	MANDATORY SUBMITTER
21	INDUSTRIAL STOWAGE AFFECTED	MANDATORY SUBMITTER
22	AVIATION IMPACT	MANDATORY SUBMITTER
23	ICD'S REQUIRED	MANDATORY SUBMITTER
24	TMA/TMI	MANDATORY SUBMITTER
25	ACAT I-IV	MANDATORY SUBMITTER
26	INTEROPERABILITY ALT	MANDATORY SUBMITTER
27	OTHER SYSTEMS INTERFACE	OPTIONAL SUBMITTER
28	IBOM	MANDATORY SUBMITTER
29	CATEGORY CODE	MANDATORY SUBMITTER
30	COST INDICATOR	MANDATORY SUBMITTER
31	IMPLEMENTATION LEVEL CODE	MANDATORY SUBMITTER
32	MATERIAL COSTS	MANDATORY SUBMITTER
33	INSTALLATION MANDAYS	MANDATORY SUBMITTER
34	DSA MANDAYS	MANDATORY SUBMITTER
35	TOC	MANDATORY SUBMITTER
36	PRIORITY	OPTIONAL SUBMITTER
37	SAR PREPARER	MANDATORY SPM
38	SAR APPROVER	MANDATORY SPM
39	JCF SUBMITTER	MANDATORY SUBMITTER
40	LEAD LCM (Logistics)	MANDATORY SUBMITTER
41	ENGINEERING AGENT APPROVAL	MANDATORY SPM
42	SYSTEM TPOC	MANDATORY SUBMITTER
43	08 CONCURRENCE	MANDATORY SPM
44	TYPE COMMANDER CONCURRENCE	MANDATORY SPM
45	OTHER CONCURRENCE	OPTIONAL SPM
46	SHIP PROGRAM MANAGER APPROVAL	MANDATORY SPM

FIGURE 2

TECHNICAL SPECIFICATION

**TITLE: ALTERATIONS TO SHIPS ACCOMPLISHED BY ALTERATION
INSTALLATION TEAMS**

NO.: TS9090-310C

DATE: JUNE 00

SUPERSEDES: TS9090-310B, dated October 97



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**PUBLISHED BY
COMMANDER, NAVAL SEA SYSTEMS COMMAND**



DEPARTMENT OF THE NAVY

NAVAL SEA SYSTEMS COMMAND
2531 JEFFERSON DAVIS HWY
ARLINGTON VA 22202-51604720 IN REPLY REFER TO
Ser 04M3/416
26 June 2000

From: Commander, Naval Sea Systems Command

Subj: NAVSEA TECHNICAL SPECIFICATION 9090-310C, ALTERATIONS TO
SHIPS ACCOMPLISHED BY ALTERATION INSTALLATION TEAMSRef: (a) NAVSEA Technical Specification 9090-310C, Alterations
to Ship Accomplished by Alteration Installation Teams

1. The purpose of this letter is to promulgate and implement reference (a) to ensure proper accomplishment and centralized control of shipboard installations and alterations performed on active and reserve fleet ships by Alteration Installation Teams (AITS). Reference (a) clearly defines the use of AITS and emphasizes that close coordination must be maintained with the cognizant Command Ship Program Manager (SPM), the applicable equipment or system Life Cycle Manager (LCM), the cognizant Planning Yard, the cognizant Type Commander (TYCOM) and, when applicable, the Naval Supervising Activity (NSA) or Regional Maintenance and Modernization Coordination Office (RMMCO).
2. Reference (a) provides requirements for the planning, estimating, scheduling, design and accomplishment of logistically supported alterations on active and reserve fleet ships by AITS and provisions for a Quality System for accomplishment of such work, except as noted in reference (a), Section 1.4. This specification is applicable for all AIT installations regardless if accomplished in CNO assigned availabilities or AIT installations accomplished outside such availabilities.
3. Reference (a) will reside on the Fleet Modernization Program (FMP) Website. To obtain a copy of reference (a) by sections or in its entirety, the URL address is <http://www.fmp.navy.mil>. To access reference (a), click on Business Policy/Process, and then FMP Library. Please be advised that this is a restricted website and you will be prompted to enter your FMPMIS Oracle user ID and password, or you may apply for this information. Hard copies of this document will not be distributed or stocked.
4. NAVSEA 04M3 point of contact for FMP Documentation is Mrs. Sharon Ann Shaw, SEA 04M312. Mrs. Shaw can be reached at (703) 602-1151 extension 117 or by e-mail at ShawSA@navsea.navy.mil.

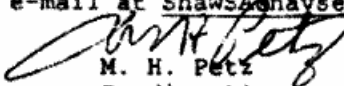

M. H. Petz
By direction

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ALTERATIONS TO SHIPS ACCOMPLISHED
BY ALTERATION INSTALLATION TEAMS

1. SCOPE

1.1 General

OPNAVINST 4720.2 establishes policies and procedures for the planning and management of the Fleet Modernization Program (FMP) and establishes the Ship Alteration (SHIPALT) as the vehicle for implementation of permanent configuration changes to ships and ship systems. NAVSEA SL720-AA-MAN-010/FMP implements the policies and procedures of OPNAVINST 4720.2. NAVSEA Technical Specification (NSTS) 9090-310 is an appendix of NAVSEA SL 720-AA-MAN-010/FMP for alterations to ships accomplished by alteration installation teams. This specification provides requirements for the planning, estimating, scheduling, design and accomplishment of logistically supported alterations on active and reserve fleet ships by Alteration Installation Teams (AITs) and provisions for a Quality System for accomplishment of such work, except as noted herein (see 1.4). This specification is applicable to ALL AIT installations regardless if accomplished in CNO assigned availabilities or AIT installations accomplished outside such availabilities.

a. Budgeting. Details of the budgetary process for SHIPALTs accomplished by AITs are contained in NAVSEA SL720-AA-MAN-010/FMP, Section 6.

b. Funding. SHIPALT accomplishments are funded based on the budgeted and programmed requirements. Details of financial management of SHIPALTs accomplished by AITs are contained in NAVSEA SL720-AA-MAN-010/FMP, Section 6.

1.2 Definitions

As used in this document, the following definitions apply:

a. Alteration. Any change in the hull, machinery, equipment or fittings of a ship which involves a change in design, materials, number, location or relationship of the component parts of an assembly regardless of whether it is undertaken separately from, incidental to or in conjunction with repairs.

b. Alteration Completion Report. A standardized report format provided as Appendix C to this specification used to report the completion of an alteration installation.

c. Alteration Equivalent to a Repair. An alteration which has one or more of the following attributes:

(1) The use of different material, which has been approved for like or similar use, and such materials are available from standard stock.

(2) The replacement of obsolete, worn-out or damaged parts, assemblies, or equipment, requiring renewal by a more efficient design previously approved by the cognizant SYSCOM, PEO or SPM; providing such replacement does not cause a change to the existing system design and does not effect a change to the systems or equipment normally associated with the military characteristics of the ship.

(3) The strengthening of parts that require repair or replacement in order to improve reliability of the parts and of the unit provided no other change in design is involved.

(4) Minor modifications involving no significant changes in design or functioning of equipment but considered essential to prevent recurrence of unsatisfactory conditions.

(5) The replacement of parts, assemblies, or equipment with like items of later or more efficient design where it can be demonstrated that the cost of installation and maintenance of the new parts, assemblies or components is less than the cost of maintaining the installed parts, assemblies, or components; and such replacement does not cause a change to the existing system design or affect any interfacing system design and does not effect a change to the system or equipment normally associated with the military characteristics of the ship.

Only the cognizant SYSCOM, PEO or SPM exercising technical control over the article, or the authority to whom such technical control has been delegated by that command, shall designate an alteration as an AER and approve it for accomplishment.

d. Alteration Installation Team (AIT). A unit (military, civilian or contractor) under the direction of the AIT Manager or designated agent of the AIT Manager, that is trained and equipped to accomplish specific alterations on specified ships.

e. Alteration Management Planning (AMP) Program. The Alteration Management Planning Program, under SEA 04M, provides management of alterations with a focus on Battle Force interoperability. This office, in collaboration with alteration sponsors is responsible for providing a Master List of all alterations, both permanent and temporary, with applicability to Navy ships. The Master List will indicate whether or not each planned alteration installation is considered "mature" (see

paragraph 1.2.i, below), and whether or not the planned alteration has been authorized and scheduled for installation.

f. AIT Activity or AIT Manager. The activity, military person or government civilian tasked and funded by the AIT Sponsor to initiate, plan, coordinate, schedule, manage and oversee the successful accomplishment of the alteration in accordance with FMP policy and procedures.

g. AIT Sponsor. The cognizant System Command (NAVAIR, NAVSEA, SPAWAR), Program Executive Office (PEO), Participating Manager (PARM), Ship Program Manager (SPM), FLTCINC, TYCOM, CNO or other sponsor which tasks and funds the AIT.

h. Alteration, permanent. Any logistically supported alteration, which is intended to remain on board the ship for more than one year or more than one operational deployment. These alterations are accomplished as Ship Alterations (SHIPALTs), Alterations Equivalent to a Repair (AERs), TYCOM Alts, and other SYSCOM and TYCOM alterations (e.g. Field Changes (FCs), Engineering Changes (ECs), etc.)

i. Alteration, mature. An alteration that has a reasonable expectation of successful installation, operation, maintenance and interoperability and is fully supported logistically.

j. Alteration, temporary (TEMPALT). Any alteration which provides given capabilities on a temporary basis (not to exceed one [1] year or one [1] operational deployment in duration). TEMPALTs support Research, Development, Test and Evaluation (RDT&E) exercise or mission requirements. TEMPALTs are reviewed and technically approved by the cognizant Ship's Program Manager (SPM) and authorized for accomplishment by the cognizant TYCOM. The SPM review considers logistic support, safety, technical adequacy, impact on ship stability, operational characteristics, damage control, ship structure, ship services, ship interfaces and habitability. ILS (final or preliminary) needs to be identified on the TEMPALT authorization letter and provided at time of install. Alterations which are intended to be installed for a period in excess of one year or for more than one operational deployment are permanent changes to a ship's configuration and shall be accomplished accordingly (see "Alteration, permanent"). After completion of testing requirements, mission or exercise support requirements or one year, whichever comes first, TEMPALTs must be removed and the ship restored to its previous configuration. The activity sponsoring the accomplishment of the TEMPALT shall be responsible for funding the removal of the TEMPALT and the restoration of the ship.

k. As-Builts. Drawings prepared or developed by an AIT, approved by the Planning Yard, used for installation and revised to indicate the actual, as installed, configuration on the ship.

l. Battle Force Baseline Configuration Alterations. Alterations authorized in support of the Battle Force configuration, as determined by the Fleet CINC and SEA 53 under the D-30 process. These alterations are approved by the SPM and coordinated with the Alteration Management Planning (AMP) office, AMP Field Coordinating Offices (FCOs) and NSAs, in accordance with this document.

m. Equipment Alteration. Any modification, other than a SHIPALT, to the configuration of an equipment or system (including embedded equipment, computer programs and expendable ordnance) after establishment of the product baseline. An Equipment Alteration involves a change in design, type of material, quantity, installed location, logistics, supportability or the relationship of the component parts of an assembly within the ship or shore installation. Equipment Alterations include the addition, deletion, rework or replacement of parts, assemblies or equipment; or changes in assembly procedures. Alterations to associated computer programs include the incorporation of different computer program versions and approved modification or corrections to both operational test and maintenance programs. Equipment Alterations are initiated by approved Class I Engineering Change Proposals (ECPs). Equipment Alterations apply equally to changes installed in delivered systems and equipment, and changes installed in systems and equipment in production to identify differences from an established product baseline. Equipment Alterations may be initiated to correct a design defect, to change equipment operational capability, to eliminate safety hazards, to update obsolete components or for any combination of these reasons. There are five types of Equipment Alterations:

(1) Machinery Alteration (MACHALT). A planned change, modification or alteration of any hull, mechanical or electrical (HM&E) equipment in service (shipboard or ashore) when it has been determined by the MACHALT Configuration Control Board that the alteration or modification meets all of the following conditions:

(a) Can be accomplished without changing an interface external to the equipment or system.

(b) Are modifications made within the equipment boundary or is a direct replacement of the original equipment system.

(c) Can be accomplished without the ship being in an industrial activity.

(d) Will be accomplished individually and not conjunctively with a SHIPALT or other MACHALT.

If power, weight or air conditioning requirements are modified, the modification must be discussed with the appropriate SPM, who will decide whether to proceed with the modification as a MACHALT or SHIPALT.

(2) Ordnance Alteration(ORDALT). An ORDALT is a change made to ordnance equipments or their computer programs by the addition, deletion, rework or replacement of parts, assemblies or equipment, or by a change in assembly procedures.

(3) Field Change (FC). A mechanical, electronic or electrical change, modification or alteration made to electronic equipment after delivery to the government or installation on board ship, including software changes, which does not impact interfaces to other equipment within the ship, change the footprint, form or fit or change power, weight or air conditioning requirements. If power, weight or air conditioning requirements are modified, the modification must be discussed with the appropriate SPM, who will decide whether to proceed with the modification as a field change or SHIPALT. Field Changes are initiated and approved by the cognizant Systems Command and are implemented by Field Change Bulletin (FCB). AIT or Ship's Force can accomplish FCs. For these specific types of alterations, the cognizant SPM shall be notified of the approved changes effecting their respective platforms, shall be periodically advised of installation status and shall be notified of any logistics upgrades which have been completed as a result of the alteration.

(4) Engineering Change (EC). A modification, usually to Under-Sea Warfare (USW) equipment or systems, or other equipment groups as designated by the cognizant Systems Command, PMS, PARMS and CCBs.

(5) Alteration & Improvement (A&I) Item. Tests inspections and minor alterations to submarines and submarine tenders. No significant ILS impact or significant material required. A&I items are approved by NAVSEA and authorized by TYCOM.

n. Hardware Systems Commands (HSC) - COMNAVSEASYS COM is the lead hardware systems commander for the life cycle management of ships. Commander, Naval Air Systems Command and Commander, Space and Naval Warfare Systems Command are also hardware systems commands. They must coordinate with COMNAVSEASYS COM in the development of technical requirements essential to performing

quality maintenance. The HSC provides NAVSUP with sufficient, accurate, and up-to-date technical information to ensure consistent procurement and control of material that fulfills all technical requirements.

o. Industrial activity. Any activity that has the capability to perform all aspects of industrial work on ships. These activities generally include Naval Bases, Naval Ship Repair Facilities (NSRFs), Intermediate Maintenance Facilities, Trident Refit Facilities (TRFs), public (Naval) shipyards and private shipyards which hold Agreements for Boat Repair (ABR) or Master Ship Repair (MSR) Agreements in accordance with the NAVSEA Supervisor of Shipbuilding, Conversion and Repair, USN (SUPSHIP) Operations Manual.

p. Maintenance Program Master Plan. The Maintenance Program Master Plan provides a general overview of the cognizant Program Executive Office's (PEO's) and/or Ship Program Manager's (SPM's) maintenance plan for the ship class. It specifies key elements such as: depot-level availability intervals and durations, frequency or intermediate-level availabilities, and any special maintenance, maintenance support, or infrastructure requirements.

q. Naval Supervising Activity (NSA). Single Naval activity charged with the responsibility of oversight of work being accomplished on U.S. Naval ships during any type of availability. NSA's are responsible for controlling AIT access to ships at the industrial activities under their cognizance. Further, NSA's are responsible for ensuring that the AIT's intended work is authorized and that the AIT's are in compliance with this instruction. For AIT work conducted during periods in which the naval shipyards or SUPSHIP offices do not have oversight, NSA functions concerning the oversight of AIT work, including gatekeeping, production coordination, and quality assurance functions, will be the responsibility of the cognizant RMMCO office (where stood up) or as designated by the cognizant TYCOM. Neither the AIT tasking activity, the team supervisor or the AIT is the NSA for the purpose of this technical specification.

r. Quality System. A documented Quality System, which will assure that all provided supplies and services conform to a prescribed level of quality. For alterations accomplished on ships, the minimum prescribed level of quality shall be that specified in Master Ship Repair Agreements (MSRA) and Agreement for Boat Repair (ABR) as outlined in NAVSEA Standard Item 009-04. (See Appendix D)

s. Quick reaction alteration. Quick reaction alterations are those alterations (permanent or temporary, unplanned or

unscheduled), which are required to be accomplished to support urgent or emergent requirements.

t. Red Lines or Red Lined Installation Drawings. Planning yard approved SHIPALT Installation Drawings (SIDS) which have been revised manually (preferably in red ink) by the AIT to reflect all approved deviations and variances of the completed installation.

u. Regional Maintenance and Modernization Coordination Office (RMMCO). A regional Maintenance Center-aligned Fleet-chartered organization which serves as the primary point of entry for all waterfront related alteration and maintenance activities. The RMMCO will effect detailed integration scheduling of all maintenance and modernization evolutions involving ships under that RMC's cognizance and will serve as the "gate keeping" office for AIT check-in and check-out where applicable for all non-CNO availability timeframes. The RMMCO is responsible for oversight of AIT work conducted during the maintenance periods that are not supervised by a naval shipyard, NSRF, or SUPSHIP office.

v. Scheduled/Non-Scheduled availabilities. A CNO Scheduled Availability is a depot level maintenance window, which is scheduled by CNO in accordance with the Maintenance Program Master Plan for the ship.

(1) CNO Scheduled Maintenance Availabilities greater than six months in duration are:

Overhaul. An availability scheduled for accomplishment of industrial maintenance and modernization. Types of availabilities include:

- Regular Overhaul.
- Complex Overhaul
- Engineered Overhaul
- Refueling Overhaul
- Refueling Complex Overhaul
- Engineered Refueling Overhaul

Other Availabilities. An availability scheduled primarily for industrial maintenance and installation of major, high priority alterations. Types of these include:

- Depot Modernization Period
- Planned Incremental Availability
- Docking Planned Incremental Availability

(2) CNO scheduled maintenance availabilities less than six months in duration are short, labor intensive availabilities scheduled for accomplishment of industrial

maintenance and modernization. Types of these availabilities include:

- Selected Restricted Availability (SRA)
- Docking SRA
- Phased Maintenance Availability (PMA)
- Docking Phased Maintenance Availability
- Service Craft Overhaul
- Extended SRA
- Extended Docking SRA
- Incremental SRA

(3) NON-CNO Scheduled Availability. An availability which is not scheduled by CNO. The FLTCINCs/TYCOMs assign and schedule Restricted Availability (RAV), Technical Availability (TAV) and Voyage Repair (VR) availability.

w. Ship Alteration (SHIPALT). An approved permanent change to the configuration of a ship which is documented as a SHIPALT Record (SAR) and implemented through the FMP Process. SHIPALTs are classified by title.

(1) Title D SHIPALT. A permanent alteration that is equivalent to a repair, does not affect the military characteristics of a ship and may require Centrally Procured Material (CPM) but does not require Headquarters CPM (HCPM) for accomplishment. Title D alterations generally include more efficient, cost effective designs that improve ship maintainability. Title D alterations are technically approved by COMNAVSEASYSKOM and authorized for accomplishment by the FLTCINC or TYCOM.

(2) Title F SHIPALT. A permanent alteration that does not affect the military characteristics of a ship, does not require CPM and is within the capabilities of ship's force to accomplish. Title F alterations are technically approved by COMNAVSEASYSKOM and authorized for accomplishment by the FLTCINC or TYCOM.

(3) Title K SHIPALT. A permanent alteration to provide a military characteristic, upgrade existing systems or additional capability not previously held by a ship which affects configuration controlled areas or systems of a ship or which otherwise requires the installation of HCPM. These SHIPALTs are approved for development and authorized for accomplishment by the CNO (military improvements) or the Hardware Systems Command (HSCs) (non-military improvements). The technical approval for Title K SHIPALTs is provided by COMNAVSEASYSKOM .

(4) Title K-P SHIPALT. A Title K SHIPALT which is within forces afloat or Alteration Installation Team (AIT)

capability for accomplishment, and for which special program and centrally provided materials required for accomplishment of these alterations are provided as a package by the cognizant HSC.

x. Type Commander Alterations (TYCOMALTs). TYCOMS are authorized to approve temporary changes to compartments of ships, other than nuclear support facilities or compartments adjacent to ship nuclear support facilities, through use of TYCOMALTs subject to the requirements laid out in OPNAVINST 4720.2(Series).

1.3 Applicability. This specification is applicable to all alterations accomplished on any U.S. Navy ships, including surface ships, submarines and service craft (hereafter collectively referred to as "ships") by AITs except as noted herein (see paragraph 1.4).

1.4 Exceptions. This specification does not apply to:

a. Alterations to nuclear components and systems under the cognizance of the Deputy Commander for Nuclear Propulsion (NAVSEA 08).

b. Strategic Systems Program Alterations (SPALTs) issued by the Director, Strategic Systems Programs (DIRSSP).

c. Temporary modifications performed as part of a shipyard availability to support industrial work or associated testing.

d. Temporary Alterations (TEMPALTs) to be accomplished on submarines. NAVSEAINST 4720.14 and NAVSEA S9070-AA-MME-010/SSN/SSBN provide policy and procedures for submarine TEMPALTs. The requirements of this document are applicable to FLTCINC or TYCOM authorized TEMPALTs being installed on surface ships and service craft to support Research, Development, Test and Evaluation (RDT&E) programs or in support of mission or exercise requirements. The applicability of this document to TEMPALTs in support of sea trials on surface ships and service craft is at the discretion of the cognizant SPM.

e. Alterations accomplished as part of the submarine deployed site program such as Submarine Engineered Operating Cycle Modernization (SEOC MOD) availabilities.

f. Installation support personnel and certification teams, which only provide technical guidance, equipment check-out and grooming, certification of systems or on-site training for ship's force not associated with the accomplishment of an alteration.

1.5 Cancellation. This technical specification cancels and supercedes NAVSEA Technical Specification 9090-310B.

2. REFERENCED DOCUMENTS

2.1 Issues of Documents. The following documents form a part of this specification to the extent specified herein.

SPECIFICATIONS

NAVSEA

Technical Specification 9090-100 - SHIPALT Technical Liaison Services, Waivers, and Deviations

Technical Specification 9090-600 - Ship Alteration (SHIPALT) Installation Drawing (SID) Preparation

Technical Specification 9090-700 - Ship Configuration and Logistics Support Information System (SCLSIS)

PUBLICATIONS

CHIEF OF NAVAL OPERATIONS

OPNAVINST 4720.2 (series) - FLEET MODERNIZATION PROGRAM (FMP), PLANNING PROCEDURES FOR

OPNAVINST 4790.4 (series) - SHIPS MAINTENANCE AND MATERIAL MANAGEMENT (3-M) MANUAL

COMMANDER IN CHIEF ATLANTIC FLEET/COMMANDER IN CHIEF PACIFIC FLEET

CINCLANTFLT/CINCPACFLTINST 4790.3 - JOINT FLEET MAINTENANCE MANUAL

CINCLANTFLT/CINCPACFLT 4720.3 (SERIES) Management of Afloat Combat Systems and C4I Installations and Improvements

NAVAL SEA SYSTEMS COMMAND

NAVSEA 0902-018-2010 - General Overhaul Specifications for Deep Diving Submarines (GOS)

NAVSEA 0924-062-0010 - Submarine Material Certification Requirements Manual for the Submarine Safety Program

NAVSEA S9040-AA-GTP-010/SSCR - Shipboard Systems Certification Requirements for Surface Ship Industrial Periods (Non-Nuclear)

NAVSEA S9070-AA-MME-010/SSN/SSBN - Guidance Manual For Temporary Submarine Alterations

NAVSEA S9AA0-AB-GOS-010/GSO - General Specification for Overhaul of Surface Ships

NAVSEA S9AA0-AB-GOS-030 - General Specification for Overhaul of Surface Ships (GSO) AEGIS Supplement

NAVSEA SL720-AA-MAN-010/020 - Fleet Modernization Program Management and Operations Manual (Volumes 1 & 2)

NAVSEA T9066-AA-MAN-010 - Navy Outfitting Program Policy and Procedures Manual

NAVSEAINST 2450.2 - ELECTROMAGNETIC COMPATIBILITY

NAVSEAINST 4720.3 (series) - PROCESS FOR INITIATING, APPROVING AND SCHEDULING AFLOAT C4I SYSTEMS INSTALLATIONS AND UPGRADES

NAVSEAINST 4720.11 (series) - SHIPBOARD INSTALLATIONS AND MODIFICATIONS PERFORMED BY ALTERATION INSTALLATION TEAMS

NAVSEAINST 4720.14 (series) - TEMPORARY ALTERATIONS TO ACTIVE FLEET SUBMARINES; CONTROL OF

NAVSEAINST C9210.4 - CHANGES, REPAIR AND MAINTENANCE TO NUCLEAR POWERED SHIPS

NAVSEAINST 9304.1 - SHIPBOARD ELECTRICAL CABLE AND CABLEWAY INSPECTION AND REPORTING PROCEDURES

NAVSEA Standard Items (These can be obtained from the web site <http://www.supship.navy.mil/ssrac4/standard.htm>)

NATIONAL SECURITY TELECOMMUNICATIONS AND INFORMATION SYSTEMS SECURITY MEMO

NSTISSM TEMPEST/2-95 of 12 Dec 95

3. REQUIREMENTS

3.1 General. OPNAVINST 4720.2 establishes policies and procedures for the planning and management of the Fleet Modernization Program (FMP) and establishes the Ship Alteration (SHIPALT) as the vehicle for implementation of permanent configuration changes to ships and ship systems. NAVSEA SL720-AA-MAN-010/FMP implements the policies and procedures of OPNAVINST 4720.2. NAVSEAINST 4720.11 defines the use of AITs in this process and in the accomplishment of TEMPALTs. This specification outlines the process to be followed for the

planning, estimating, scheduling, and accomplishment of all alterations (except as defined in paragraph 1.4), both permanent and temporary, to ships by AITs.

3.1.1 Quick reaction alteration accomplishment. In the event that an AIT Manager is directed to accomplish an unplanned/unscheduled alteration, the accomplishment of that alteration shall be in accordance with the requirements outlined in this specification. If provisions of this specification can not be met, the AIT Manager shall submit a waiver request to the applicable SPM for approval, as defined by CNO policy, with an information copy to the cognizant Planning Yard, TYCOM, cognizant NSA and other activities as appropriate. Waiver requests may be made by letter or message, shall explain why specific provisions of this specification cannot be met, and shall indicate when these provisions will be corrected/completed. Initiation of work impacting the material readiness of the ship shall not begin until the waiver is granted. In all cases, the AIT Manager should begin immediate liaison with the cognizant NSA to facilitate rapid installation completion.

3.2 Pre-installation SHIPALT and Equipment Alterations (MACHALT, ORDALT, Field Changes (FC), Engineering Change (EC)) Requirements.

3.2.1 Initial determination of SHIPALT/Equipment Alteration accomplishment by AIT. The initial determination that a given SHIPALT/Equipment Alteration could be accomplished by an AIT is usually made by the Chief of Naval Operations (CNO) Resource Sponsors (military improvements), the cognizant SYSCOM (technical improvements) or the TYCOMs (AERs) when the alteration is approved as a feasible and desirable requirement. In general an AIT should be used when the technical and/or specific nature of the work requires an AIT, a substantial government financial savings can be obtained, flexibility of an AIT is required due to short timeframe installs, or substantial "lessons learned" can be obtained from re-using the same team.

3.2.2 Equipment Alteration development. The cognizant Life Cycle Manager (LCM) should begin alteration development in accordance with the configuration control requirements of the applicable equipment prior to, or concurrent with, the initial determination that a given alteration is to be accomplished by an AIT. A determination should also be made of whether or not ship, system or equipment certification in accordance with NAVSEA S9040-AA-GTP-010/SSCR will be required upon completion of the alteration development. This determination is part of the alteration development. If certification is required, the activity to perform certification testing should be determined when the activity that will be assigned the responsibilities of AIT is determined. The AIT Manager will ensure that the alteration

development effort is fully coordinated with the cognizant SPM(s) and Life Cycle Manager (LCM).

3.2.3 SHIPALT development. Prior to, or concurrent with, the initial determination that a given SHIPALT is to be accomplished by an AIT, the cognizant Systems Command should begin alteration development. This will include development and approval of a Justification Cost Form (JCF), in accordance with NAVSEA Tech Spec 9090-210 or equivalent, and entry of the requirement into the FMP Management Information System (FMPMIS) database. SHIPALT development also includes updating of applicable configuration baseline documentation, coordination with the applicable Planning Yard to avoid creating interference with other SHIPALT designs, and completion of SHIPALT Record (SAR) development, in accordance with NAVSEA Tech Spec 9090-500B. The SPM, for all alterations under his cognizance, must also determine whether ship or system certification in accordance with NAVSEA S9040-AA-GTP-010/SSCR will be required upon completion of the alteration, select the activity which will be assigned the responsibilities of AIT and, when applicable, select the activity to perform certification testing. The AIT Manager will ensure that the AIT effort is fully coordinated with the cognizant SPM, Life Cycle Manager (LCM), the cognizant NSA and Planning Yard.

3.2.3.1 Initial entry of a SHIPALT requirement into FMPMIS. The SPM shall enter a SHIPALT requirement into the FMPMIS database using procedures indicated in NAVSEA SL720-AA-MAN-010/020 as soon as the requirement is approved, generally after approval of the JCF and assignment of the SHIPALT number. The FMPMIS entry should indicate that the alteration is capable of being accomplished by an AIT. Material/equipment which has been identified in the JCF as being procured by the AIT from the Federal Supply System should be entered into FMPMIS by the SPM as part of the initial SHIPALT entry so that the applicable procurement activity can be aware of the requirement.

3.2.3.2 Cost Estimating for SHIPALTs. When the SHIPALT is entered into FMPMIS as "AIT CAPABLE", an estimate of the cost of alteration accomplishment by AIT, to include additional industrial support services required by the AIT, but not within AIT capability, will be entered as well as an estimate of the cost of alteration accomplishment by an industrial activity. At the JCF stage of alteration definition, costs are difficult to estimate with any degree of accuracy, but provisions for these requirements must be made. The estimate will be entered into FMPMIS by the SPM after approval of the JCF. After the SAR is prepared and the full extent of the SHIPALT has been defined, more accurate estimates must be developed and entered into FMPMIS by the SPM to provide a more accurate basis for budget development. The following factors must be considered in the development of the cost estimate:

a. Installation manday estimates for JCFs. Installation mandays are the number of mandays required to actually accomplish the SHIPALT. This includes certification testing (if required), along with certification test report development, and all associated incidental work. Incidental work includes interference removal and reinstallation, fastener replacement, replacement of damaged insulation and deck matting, cableway banding, painting, clean-up, training, documentation update, etc. Also included are industrial support services (e.g. crane services, local office facility, electricity, hazardous waste disposal, welding, compressed air, and other services listed in paragraph 3.4.3 of this specification) not provided by the AIT; these services may be provided by a Naval Station outside of a CNO scheduled availability, or by a Naval Shipyard or ABR/MSR contractor during a CNO scheduled availability. The JCF for SHIPALT accomplished by AITs shall reflect the number of mandays required to accomplish the alteration in its entirety, including the incidental work described herein. After the SAR is prepared and the full extent of the SHIPALT is defined, a more accurate estimate shall be developed and entered into FMPMIS by the SPM.

b. Planning mandays for JCFs. Planning mandays are those mandays required to perform the necessary planning to accomplish an alteration on one ship. This includes mandays to be expended for the acquisition of AIT-furnished material, prefabrication of assemblies, equipment burn-in, packaging/crating of equipment, management functions and, when applicable, certification test plan development. At the JCF stage of SHIPALT development, required planning mandays are difficult to estimate with any degree of accuracy but some provision for these requirements must be made. After the SAR is prepared and the full extent of the SHIPALT has been defined, a more accurate estimate shall be developed and entered into FMPMIS by the SPM.

c. Incidental material estimates for JCFs. Incidental material is that material which the AIT will be required to procure to accomplish a SHIPALT. This includes all material not being supplied as Headquarters Centrally Procured Material (HCPM), including consumable materials such as welding rods, paint, etc., required to complete a SHIPALT. After the SAR is prepared and the full extent of a SHIPALT is defined, a more accurate estimate shall be developed and entered into FMPMIS by the SPM.

3.2.4 Planning. The AIT Manager should begin planning a tentative schedule of alteration accomplishment as soon as the determination is made to accomplish the alteration by AIT. For SHIPALTS, the planning schedule should be based on SPM approval of SAR, SID and ILS, and the schedule of equipment delivery, the availability of AITs, the availability of ILS products, and the anticipated industrial availability schedules of applicable ships. For Equipment Alterations, the planning schedule should

be based on the schedule of alteration kit deliveries, the availability of AITs, the availability of ILS products and the anticipated industrial availability schedules of applicable ships. If system certification, in accordance with NAVSEA S9040-AA-GTP-010/SSCR, is required for SHIPALTS or Equipment Alterations, the certification testing schedule must also be included. The planned schedule of accomplishment and, if applicable, system certification should be fully coordinated with the cognizant SPM(s), the LCM (if not the AIT Manager), Alteration Management Planning (AMP) organization, the cognizant NSA, Planning Yard(s), and the TYCOM(s). If the SHIPALT or Equipment Alteration is planned for accomplishment during a CNO scheduled availability, the schedules of alteration accomplishment and system certification shall also be coordinated with the cognizant NSA. The NSA will normally require submission of a tentative SHIPALT or Equipment Alteration installation schedule at A-180 days, for CNO Scheduled Availabilities, in order to ensure its integration into the overall production schedule. If the SHIPALT or Equipment Alteration is to be accomplished by someone other than the prime contractor/shipyard, the AIT will be allowed access to spaces and systems on a not-to-interfere basis with prime contractor/shipyard priority work.

3.2.5 Scheduling

a. TYCOM AIT Scheduling Process for SHIPALTS/Equipment Alterations/TEMPALTS.

(1) Outside of Scheduled CNO Availabilities. The AIT activity or the AIT Manager shall present the proposed alteration accomplishment schedule to the SPM and TYCOM for coordination and concurrence. This will allow advance notification to applicable ships, the cognizant Configuration Data Manager (CDM), the cognizant NSA and the cognizant Planning Yard of the intent to accomplish the alteration. For SHIPALTS and TEMPALTS this information is entered into the Fleet Modernization Program Management Information System (FMPMIS). For all other equipment alterations, this information is electronically transferred into the Alteration Installation Planning System (AIPS) or manually entered into the Global Alteration Installation Team Scheduling (GAITS) database. This becomes the actual programming of the alteration for accomplishment outside of a scheduled CNO availability. In addition, if affected ships have the Shipboard Non-tactical ADP Program (SNAP) installed, the information will be transmitted to the ship. For ships that do not have SNAP installed, a hard copy Mini-COSAL must be developed by the Naval Inventory Control Point (NAVICP), Mechanicsburg, and returned to the AIT. The AIT must have this document at the time of alteration accomplishment. At the time of entry in FMPMIS, AIPS

or GAITS, an OPNAV Form 4790/2K is required to be provided to the TYCOM for loading in the Regional Maintenance Automated Information System (RMAIS) shore file to document the scheduling and, later, the accomplishment of the alteration in 3M. Additionally, if the AIT will require industrial support as listed in paragraph 3.4.3 of this specification (e.g., crane and rigging services, welding/burning, compressed air, etc.) during accomplishment of the alteration, additional information (OPNAV Form 4790/2K) requesting these services will be provided for loading into the RMAIS shore file.

(2) During Scheduled CNO Availabilities. The AIT activity or the AIT Manager shall present the proposed alteration accomplishment schedule to the SPM and TYCOM for coordination and concurrence. This will allow advance notification to applicable ships, the cognizant Configuration Data Manager (CDM), the cognizant NSA and the cognizant Planning Yard of the intent to accomplish the alteration. For SHIPALTS and TEMPALTS this information is entered into the Fleet Modernization Program Management Information System (FMPMIS). For all other equipment alterations, this information is electronically transferred into the Alteration Installation Planning System (AIPS) or manually entered into the Global Alteration Installation Team Scheduling (GAITS) database. This becomes the actual programming of the alteration for accomplishment outside of a scheduled CNO availability. In addition, if affected ships have the Shipboard Non-tactical ADP Program (SNAP) installed, the information will be transmitted to the ship. For ships that do not have SNAP installed, a hard copy Mini-COSAL must be developed by the Naval Inventory Control Point (NAVICP), Mechanicsburg, and returned to the AIT. The AIT must have this document at the time of alteration accomplishment. At the time of entry in FMPMIS, AIPS or GAITS, an OPNAV Form 4790/2K is required to be provided to the TYCOM for loading in the Regional Maintenance Automated Information System (RMAIS) shore file to document the scheduling and, later, the accomplishment of the alteration in 3M. Additionally, if the AIT will require industrial support as listed in paragraph 3.4.3 of this specification (e.g., crane and rigging services, welding/burning, compressed air, etc.) during accomplishment of the alteration, additional information (OPNAV Form 4790/2K) requesting these services will be provided for loading into the RMAIS shore file.

The AIT Manager shall request the cognizant SPM to include the alteration in the Availability Advance Planning Letter and in the subsequent Availability Authorization Letter for that CNO availability. The AIT Manager shall keep the cognizant TYCOM, the LCM (if not the AIT Manager), the cognizant SPM, the CNO availability planning activity, the cognizant Configuration Data Manager (CDM), the cognizant Planning Yard, and the cognizant NSA informed of the AIT's schedule and any schedule changes. In addition, the required support services must be specified as described Standard Work Template (SWT) 980-01, "Support Services,

Provide". The cognizant NSA can then prepare a 4E specification work item in accordance with the SUPSHIP Operations Manual for inclusion in the CNO availability solicitation for private sector industrial availabilities, or a job summary and Task Group Instruction (TGI) for naval shipyard availabilities.

b. Urgent Scheduling. For urgent or emergent alterations, (including Equipment Alterations), which do not have sufficient lead time for proper scheduling, upon SPM providing approval, scheduling, in the most expeditious manner available, will be accomplished directly with the TYCOM or the TYCOMs designee. Once scheduling is established, the cognizant SPM, AIT Manager, the LCM (if not the AIT Manager), the Planning Yard, the CDM, and the cognizant NSA shall be notified of the schedule. At this same time, an OPNAV Form 4790/2K is to be provided to the TYCOM for loading in the Regional Maintenance Automated Information System (RMAIS) shore file to document the scheduling and, later, the accomplishment of the alteration in 3M. Additionally, if the AIT will require industrial support (e.g., crane and rigging services, welding/burning, compressed air, etc.) during accomplishment of the alteration, an additional OPNAV Form 4790/2K requesting these services will be provided to the TYCOM for loading in the RMAIS shore file. The AIT Manager shall keep the cognizant TYCOM, the cognizant SPM, the cognizant Configuration Data Manager (CDM), the cognizant Planning Yard, and the cognizant NSA informed of any schedule changes.

c. Scoping and Readiness Assessments. At the time the alteration schedule is presented to the TYCOM, the AIT shall provide an assessment of the size of the effort (number of mandays), estimated total length of time required to complete the installation (number of calendar days) and the possible impact on ship readiness requirements. When required, the TYCOM will take action to establish a Restricted Availability (RAV) or Technical Availability (TAV) in coordination with the appropriate operational commander unless the alteration is scheduled to be accomplished during a CNO scheduled availability. Following TYCOM approval for installation during any period other than a CNO availability, the AIT will contact the cognizant NSA to facilitate generation of a detailed ship installation schedule, inclusion of the ALT installation into the ship's maintenance and modernization work integration plan, determination of potential cross-task common support opportunities, determination of common "trade" tasks that might be accomplished under the NSA's auspices and determination of common service (e.g., electrical power, water, etc.) cost allocation.

3.2.6 AIT tasking. An AIT activity must be tasked to accomplish a specific alteration by the applicable equipment/system LCM (NAVAIR, NAVSEA, SPAWAR), by the cognizant SPM, or by TYCOMs. AITs should be tasked as soon as funding is identified, as early in the fiscal year as possible to allow the AIT the maximum

possible planning time. The tasking may be in one or two parts, depending on the level of involvement the AIT is to have. If the alteration design and ILS documentation is to be prepared by another activity (usually the applicable Planning Yard), the AIT may be tasked only for procurement of required long lead time and incidental material and accomplishment of the SHIPALT. The AIT Manager shall ensure copies of the tasking (and all subsequent changes) are forwarded to the SPM, the equipment/system LCM, the AMP office (SEA 04M5) and the applicable Planning Yard. AIT managers will ensure that all AITs under their control are directed to report to the applicable NSA prior to boarding the ship.

3.2.6.1 Design development tasking. Normally the applicable Planning Yard will be tasked and funded to develop the detailed design and associated drawings for SHIPALTs. When design development for a Title K SHIPALT can not be completed by the Planning Yard in time to support the scheduled alteration accomplishment, the SPM and the AIT Manager may elect to choose another activity for development of the detailed design based on competitive bid or best value. The competitive bid process shall include the cognizant Planning Yard. The design development task will authorize development by a qualified design agent of detailed design and associated drawings (including the performance of shipchecks), preparation of applicable Integrated Logistic Support (ILS) documentation, development of acceptance testing documentation and, when required, a preliminary certification test plan. Tasking will address all items in Appendix A. Unless otherwise agreed by the SPM and the AIT Manager, the cognizant SPM shall be the only activity to task Planning Yard efforts.

3.2.6.2 Alteration accomplishment tasking. Tasking for accomplishment of alterations will authorize procurement of required long lead time and incidental material and accomplishment of the applicable SHIPALT. Tasking will address all items in Appendix A.

3.2.7 SHIPALT design development. In accordance with NAVSEA SL720-AA-MAN-010, the class Planning Yards are responsible for the total integrated design of assigned ships and are normally tasked to develop the detailed design of alterations to these ships and associated ship systems. In those instances where the detailed design is not developed by the Planning Yard, the SHIPALT design development shall be coordinated with the Planning Yard. The final design products, including drawings, shall be approved by the cognizant Planning Yard as a minimum (see 3.2.7.4). Drawing approval and SPM authorization shall be obtained prior to the initiation of work.

3.2.7.1 SHIPALT design requirements development. The basic alteration design criteria for a given SHIPALT (including

prerequisite/concurrent SHIPALTs, ORDALTs, MACHALTs, etc.) shall include the following items as applicable:

- Magnetic material restrictions
- Electromagnetic Compatibility (EMC) requirements
- Electromagnetic Interference (EMI) requirements
- Radiation Hazard (RADHAZ) requirements
- Noise, Shock and Vibration (NSV) requirements
- Electrostatic Discharge (ESD) requirements
- Electromagnetic Pulse (EMP) requirements
- Radar Cross Section (RCS) requirements
- Signal Security (SIGSEC) and TEMPEST requirements
- Submarine Safety (SUBSAFE) program requirements
- Impact on interfaced systems
- Battle group interoperability

Alteration design shall address impacts on ship services (electrical power and lighting, heating, ventilation, air conditioning, cooling water, cooling air, deck strength, ship mass properties), stability (weight, moment, etc., storage capacity, etc.) and other critical ship systems such as the Collective Protection System (CPS) and Countermeasures Washdown System (CMWDS). The AIT shall interface with the cognizant Planning Yard to obtain associated ship system impacts.

3.2.7.2 SHIPALT Installation Drawings (SIDs). Individual SIDs shall be prepared in accordance with NAVSEA Technical Specification 9090-600 for each hull authorized in the tasking documentation, unless development of class-applicable SIDs has been authorized by the cognizant SPM. The alteration design that is represented in these drawings will be based on criteria presented in the approved SAR for the SHIPALT, design guidance provided by the Planning Yard, actual configuration determined during a design shipcheck of the applicable ship and from NAVSEA 0902-018-2010, NAVSEA S9AAO-AB-GOS-010/GSO or other general specification as applicable.

3.2.7.2.1 SHIPALT design shipcheck. Whether the design is developed by the Planning Yard or an AIT, a design shipcheck will be conducted on each hull when the AIT Manager and SPM determine the technical risk warrants the cost. Shipchecks shall be conducted at the convenience of the ship being checked following the policies of the cognizant TYCOM on a not-to-interfere basis. For those TYCOMs that hold AIT Scheduling Conferences, shipchecks shall be scheduled at these conferences. Ship availability dates will be coordinated between the activity developing the alteration design and the respective TYCOM or TYCOM designee. Whether a shipcheck is to be accomplished inside or outside of a CNO scheduled availability, the AIT shall provide visit clearance information to the cognizant NSA a minimum of five working days prior to arrival or as established by TYCOM policy.

When an AIT is performing the shipcheck, participation by the cognizant Planning Yard shall be required as specified in the tasking documentation. The AIT, in coordination with the SPM's designated design agent and/or the Planning Yard, shall issue a shipcheck report within ten working days after the design shipcheck is completed. The shipcheck report shall include redline mark-ups, when applicable, to reflect the ship's unique configuration to the Planning Yard to allow coordination and to identify interference's/interaction with other SHIPALT designs which may be under development by the Planning Yard. Unless otherwise agreed to by the SPM and the AIT Manager, the cognizant SPM shall be the only activity to task Planning Yard efforts. (See Appendix E.)

3.2.7.3 Support documentation. The AIT is responsible for ensuring delivery of all documentation and ILS elements required in the Fleet Modernization Program (FMP) Manual (NAVSEA SL720-AA-MAN-010/020, Sections 4, 7, 8 and 9) to be supplied as part of the SHIPALT or Equipment Alterations at the time of alteration accomplishment. This will include, as applicable: Supply support updates, redline mark-ups of Ship's Selected Record (SSR) documentation (Selected Record Drawings [SRDs], Liaison Action Requests (LAR's), Ship's Information Books [SIBs], Ship's Systems Manuals [SSMs], Training Aid Books [TABs], Combat System Technical Operating Manual [CSTOM], Combat System Operation and Sequencing System [CSOSS], Engineering Operation and Sequencing System [EOSS], Engineering Operations Procedure (EOP), etc.) and all required ILS/3M/SCLISIS documentation (technical manuals, PMS, 4790/CK, etc.) whether developed by the AIT or not. The LCM shall provide the cognizant SPM with a copy of ILS Certification for approval in accordance with NAVSEA SL720-AA-MAN-010, section 8-1.4.2, and NAVSEA SL720-AA-MAN-020, Appendix F, exhibit III.

a. Configuration and logistic support updates. The LCM is responsible for insuring that all equipments have proper logistics support completed and available for delivery to the ship at the time of the first alteration installation. This includes interim supply support (both initial outfitting and wholesale stock) until Material Support Date (MSD) has been reached. As part of this responsibility, the LCM will task the AIT Manager to provide accurate and timely configuration and logistics change information: to the ship's CDM (generally the cognizant Planning Yard) in the form of Configuration Overhaul Planning (COP) data; as well as to the Supply System in the form of Program Support Data (PSD) prior to, or concurrent with, alteration accomplishment.

(1) Configuration Overhaul Planning (COP) data is the preferred method of providing a ship with supply support. Unsequenced ASI tapes should never be used.

(2) All other alteration logistics support documentation, including completed OPNAV Forms 4790/CK must be supplied to the ship by the AIT at the time of alteration accomplishment. Electronic transfer of 4790/CK data is the preferred method of transmittal.

b. Ship's Selected Record (SSR) documentation. The AIT will request a list of SSRs that are impacted by the SHIPALT from the Planning Yard prior to the initiation of alteration accomplishment. The actual update of the SSR will be accomplished by the Planning Yard. The AIT Manager will fund the Planning Yard to update the SSR when directed by the SPM and funded by the PARM, PEO or SYSCOM. The AIT is responsible for providing the ship and the Planning Yard with redlined copies of the impacted SSR as part of the Alteration Completion Report (Appendix C). As-installed drawings must be received by the Planning Yard for the SSR updates to be accomplished. Unless otherwise agreed to by the SPM and the AIT Manager, the cognizant SPM shall be the only activity to task Planning Yard efforts.

c. ILS/3M/SCLISIS documentation. The various elements of ILS documentation are discussed in NAVSEA SL720-AA-MAN-010/FMP. The elements of 3M documentation are discussed in OPNAVINST 4790.4. Configuration and logistics management requirements associated with SCLISIS are contained in NAVSEA Technical Specification 9090-700.

d. Certification test documentation. When certification testing is required and the AIT is tasked to perform certification testing, the AIT will issue the certification test results to the Certifying Authority within 30 days of test completion.

3.2.7.4 SHIPALT design approval. AIT-prepared design products shall be approved by the applicable Planning Yard, and SPM authorization granted for the SHIPALT installation prior to the initiation of work on any U.S. Navy ship. Unless otherwise agreed to, the AIT sponsor (SPM, PARM, PEO or SYSCOM) will provide funding for the Planning Yard review of AIT-developed design products, including drawings. Unless otherwise agreed to by the SPM and the AIT Manager, the cognizant SPM shall be the only activity to task Planning Yard efforts. Once approved, only the Planning Yard, the SPM or the SPM's designated representative can approve deviations and waivers to the design. Note NSA Chief Engineers designated in NAVSEAINST 5400.95A may approve minor deviations and waivers to the design. AITs without Planning Yard-approved drawings shall not attempt to accomplish alterations to ships without documented approval from the cognizant SPM. AITs without Planning Yard-approved designs or documented approval from the cognizant SPM shall be denied access to ships.

a. SHIPALT design impacting the propulsion plant on nuclear powered ships. Alteration designs which impact the portions of propulsion plant or designated spaces of nuclear powered ships which are not under the cognizance of the Deputy Commander for Nuclear Propulsion (NAVSEA 08) shall be approved by the cognizant SPM as required by NAVSEAINST C9210.4. All design products which indicate such an impact, whether prepared by the Planning Yard or the AIT, shall be approved by the cognizant SPM as stated above.

b. SHIPALT Drawing approval. Unless otherwise specified in the tasking documentation, AIT-developed design drawings for the first planned accomplishment of an alteration on a ship class shall be reviewed and approved by the applicable Planning Yard. When tasking indicates that the drawing review is being coordinated by the SPM, the Planning Yard, the NAVSEA Engineering Directorate and the system/equipment LCM will participate in the review. The drawings will be reviewed for: technical accuracy, design adequacy, compliance with applicable design technical requirements (SIGSEC, TEMPEST, EMC, EMI, RADHAZ, NSV, ESD, EMP, RCS, SUBSAFE, etc.) and applicable technical specifications (including new construction and General Overhaul) and format (in accordance with NAVSEA Technical Specification 9090-600) and clarity.

AIT-developed drawings will be submitted to the Planning Yard with a transmittal letter (copy to the cognizant SPM) that includes at least the following: scheduled installation date for the specific hull, two points of contact with corresponding phone numbers and e-mail addresses and an explanation of that submittal (i.e., initial review, comment incorporation validation, etc.)

Except for very large or complex alterations, **the review cycle will be sixty (60) working days or less** after Planning Yard receipt of drawings and appropriate funding. If the review can not be completed in sixty working days, the approving activity will coordinate the completion date with the AIT Manager. The requirement to review alteration designs for follow-on ships will be at the discretion of the applicable Planning Yard if not otherwise required by the tasking documentation. Generally, a Planning Yard review of follow-on ship alteration designs will be required due to significant design differences among ship hulls. The interpretation of the degree of change required in order to effect additional design review will be as defined by the cognizant SPM unless specifically delegated to the Planning Yard. The Planning Yard shall, subsequent to the review of the first ship design, advise the AIT Manager if a review of follow-on ship design is considered necessary, and under what circumstances. AITs without Planning Yard approved drawings may be denied access to ships.

(1) Drawing reviews for SHIPALTS impacting electromagnetic compatibility. Alterations to a ship's topside configuration can impact the electromagnetic wave propagation as well as the reception of signals by the ships electromagnetic sensors (i.e. radar, navigation equipment, magnetic field detectors and communications and other receivers). Additionally, below deck electrical and electronic equipment may emit or react to harmful electromagnetic energy. In accordance with NAVSEAINST 2450.2, the NAVSEA Electromagnetic Effects Office (NAVSEA 53H3) shall participate in the above drawing approval reviews for alterations which effect ship topside configurations or which add electrical or electronic equipment. These reviews are held to prevent AIT installations from creating topside interferences.

(2) Drawing reviews for SHIPALTS impacting Command and Control Spaces. Alterations to a ship's command and control spaces can have a significant impact on physical arrangements and critical system integration characteristics of the information and data control capability realized through software, networks, etc. The appropriate Systems Command Combat System Design and Engineering Group shall participate in the above drawing approval reviews for alterations which effect ship Command and Control spaces.

c. Electronic equipment test procedure/record approvals. Equipment-specific test procedures and test record forms for electronic equipment may be required to be approved for work on critical systems or for high visibility programs. The approving activity in these cases shall be the system/equipment LCM (usually the AIT Manager). When an alteration impacts interfaces with other systems or equipment via various modes (fiber or copper Local Area Networks [LANs], switchboards, etc.) the ISEAs for each impacted system or equipment shall participate in the test procedure approval process.

d. Technical liaison services. The Liaison Action Record (LAR) is the implementation tool for the formal technical liaison system between the AIT and the applicable Planning Yard. The system will facilitate resolution of questions and change requests regarding drawings and technical documentation, and the transmittal of requests for deviations and waivers. For each required deviation from an approved design, the AIT shall prepare a LAR in accordance with NAVSEA Technical Specification 9090-100 documenting the request for the design change. All LARs will be forwarded to the Planning Yard for resolution. Copies of all LARs and Planning Yard responses will be attached to redline drawing package submitted to the Planning Yard within 15 days of installation completion. All LARs which impact design shall be incorporated in SIDs by the AIT and approved by the Planning Yard as part of the final drawing update. The submittal and review

process shall take no longer than 60 days. The LAR may also be used to document Planning Yard review and approval of AIT-prepared drawings, as tasked by the cognizant SPM.

3.3 Pre-installation Requirements, TEMPALTs (Surface Ships and Service Craft).

3.3.1 Initial determination of alteration accomplishment by AIT. Except for major TEMPALTs which require significant industrial support, accomplishment of these alterations is usually considered to be within the capability of AITs. In general an AIT should be used when the technical and/or specific nature of the work requires an AIT, a substantial government financial savings can be obtained, flexibility of an AIT is required due to short timeframe installs, or substantial "lessons learned" can be obtained from re-using the same team.

3.3.2 TEMPALT development. TEMPALTs do not require the development of a formal document like the SAR which is required for SHIPALTs. Instead, a tentative Plan of Actions and Milestones (POA&M) is normally developed which outlines requirements for design shipcheck, design development, drawing approval, assembly fabrication, logistics support while installed, alteration accomplishment and alteration removal. The AIT shall coordinate the POA&M with the cognizant TYCOM, NSA and SPM as soon as the plan is developed and anytime it is revised. TEMPALTs that affect Battle Group interoperability will be coordinated with the cognizant CINCPAC prior to scheduling for installation.

3.3.3 Planning. After the tentative POA&M is issued, detailed planning must be coordinated by the AIT with the cognizant TYCOM and NSA to establish which ship is to receive the TEMPALT (if not previously identified in the tasking documentation) and planned dates the ship will be available for design shipcheck and alteration accomplishment. If the dates are coincidental to a scheduled CNO availability, AIT coordination with the cognizant NSA and the CNO availability planning activity is also required. In all cases, the AIT must provide the cognizant NSA with security clearance data in order to be granted access to the ship.

3.3.4 Budgeting. TEMPALT accomplishment is usually budgeted and funded as part of the applicable project or program for RDT&E alterations and by the cognizant FLTCINC, TYCOM or CNO Resource Sponsor for mission support alterations. Budgeting for TEMPALTs shall include sufficient funding to remove the alteration and restore the ship to its original configuration. TEMPALTs are not funded as part of the FMP.

3.3.5 Scheduling. Scheduling for TEMPALTs is performed in the same manner as for SHIPALTs (see paragraph 3.2.5). Development

of a mini-COSAL is not required for TEMPALTs which are planned to be removed within 90 days of accomplishment.

3.3.6 Tasking. Tasking of AITs for accomplishment of TEMPALTs generally includes the total effort: design development, alteration accomplishment, alteration removal and ship restoration. Tasking will address all items in Appendix A.

3.3.7 TEMPALT design development. Alteration design development for TEMPALTs is the same as for SHIPALTs (see paragraph 3.2.7), except for TEMPALT support documentation requirements for TEMPALTs which are to be removed within 90 days of the accomplishment of the alteration .

3.3.7.1 Technical Data Package (TDP). For all TEMPALTs, regardless of intended duration, a TDP shall be prepared which includes a description of the alteration, ship impact data, stress calculations, weight and moment calculations and alteration drawings.

3.3.7.2 Design drawings. Form and format of design drawings shall be as directed by the cognizant SPM.

3.3.7.3 Design approval. TEMPALT designs, including design drawings, are required to be reviewed and approved for safety and technical adequacy and impact on ship stability, operational characteristics, damage control, ship structure, ship services, ship interfaces and habitability. TEMPALTs shall be reviewed and approved as directed by the cognizant SPM. The cognizant CINC will approve TEMPALTs affecting BG interoperability. AITs without documented SPM approval of alteration designs should not attempt alteration accomplishment and may be denied access to ships.

3.3.7.4 Support documentation. TEMPALTs which are planned to be removed within 90 days of accomplishment shall be supported to the extent necessary to support operation and maintenance of the equipment for the duration of the alteration. For TEMPALTs which are intended to remain installed for more than 90 days, the same alteration support requirements as for SHIPALTs apply (see paragraph 3.2.7.3).

3.4 Installation Preparation Requirements.

3.4.1 Installation planning and preparation. The AIT shall not initiate preparation for alteration accomplishment until specifically tasked and funded by an AIT Manager. The AIT Manager will coordinate with and obtain approval of the cognizant SPM, the LCM (if not the AIT Manager) and applicable TYCOM(s) prior to tasking an AIT for accomplishment of a SHIPALT, Equipment ALT or TEMPALT.

3.4.2 Pre-installation coordination requirements. All alterations which are scheduled to be accomplished by an AIT during a scheduled CNO availability will be coordinated with and approved in advance by the cognizant SPM and the NSA which is designated to supervise the CNO availability. These alterations must be included in the NAVSEA Availability Advance Planning Letter and subsequent Availability Authorization Letter for that CNO availability. Liaison between the AIT, the CNO availability planning activity, and cognizant NSA shall be initiated no later than 180 days prior to the start of the scheduled installation. Specifically, the AIT will notify the cognizant NSA who will provide the Master Ship Repair Contractor, when applicable, of all significant installation preparation requirements include material, team formulation and pre-installation coordination by the AIT.

a. Planned accomplishment during a CNO availability. NSA notification (at least 180 days prior to the start of the availability) shall include:

- (1) AIT activity and alteration(s) to be accomplished.
- (2) Type of MSR industrial support services (welding, rigging, hazardous material handling/disposal, etc.) that will be required. See SUPSHIP Standard Work Template (SWT) 980-01, "Alteration Installation Team Support Service, Provide". A sample checklist is provided as Appendix B.
- (3) Quantity (mandays or manhours) of each service that will be required.
- (4) Listing of systems, locations and proposed sequence of events in which the AIT work will be accomplished, including any lay-down area requirements.
- (5) Verification of compliance with insurance and Quality Assurance system requirements.
- (6) Points of Contact for the AIT.
- (7) Alteration installation production and testing schedule (including ship work approximate start date). This schedule should be provided via electronic means whenever possible to facilitate its timely integration into the overall CNO availability schedule and rapid NSA review.
- (8) Expected duration of the AIT ship work (calendar days).
- (9) Installation production test schedules and Bill of Materials (desired in electronic format). These schedules will specify expected start dates and duration of all AIT

shipboard work and testing, along with time frames where there could be a significant impact on ship's operations.

b. Planned accomplishment outside of a CNO scheduled availability. When the installation is not to be accomplished during a CNO-scheduled availability, the AIT shall provide scheduling information to the TYCOM and cognizant NSA. The AIT will provide paragraph 3.4.2.a information to the cognizant NSA no later than 30 days before the start of the availability, or as directed by applicable Joint Fleet instructions/JFMM.

3.4.3 Special requirements. The AIT Manager is responsible for providing advance notification of alteration accomplishment requirements/impacts and making arrangements (including funding) for any required support services not being provided by the AIT. These arrangements shall be made with the appropriate activity, including NSA, prior to the arrival of the AIT for accomplishment of the alteration, preferably 180 days in advance, and at least 135 days in advance. Possible requirements/ impacts will be identified in the initial scheduling of the alteration for accomplishment. Identified requirements for individual ships will be discussed in detail at the ship design shipcheck out-brief and will be verified at the alteration accomplishment in-brief. Notification of these requirements may include, but are not limited to:

a. Material delivery and stowage requirements (number of boxes/pallets, special handling [such as ESD, SUBSAFE, magnetic protection, etc.], special stowage, etc.)

b. Crane service requirements (capacity, onload, offload, high reach, etc.)

c. Rigger service requirements.

d. Impacted areas and spaces, including required access to secure spaces.

e. Inspection requirements (gas free, SIGSEC, TEMPEST, weight tests, etc.)

f. Scope of Pre-Installation Equipment Check-Out (PICO) requirements for ship's force validation of existing equipment/-system operating conditions prior to accomplishment of the alteration (specific equipments, testing, etc.)

g. Scope of hot work requirements (cutting, welding, brazing, etc.)

h. Fire watches (number of welders working, number and length of shifts, etc.)

i. Access cut requirements.

j. Work control review of specific equipment, systems, circuits, components, piping, or valves which will require isolation, deactivation or removal to accomplish planned work and any associated tag-out processing requirements.

k. Planned handling, use and disposal of identified hazardous materials (i.e., fluorocarbons, paint, welding rods, partially used material, etc.)

l. Specific ventilation/environmental requirements (special air flow/cooling/heating requirements, protective shelters to be installed, etc.)

m. Ship systems service requirements (power, low or high pressure air, etc.) which may be required to support the accomplishment of the alteration or calibration or certification of the equipment.

n. Weapons handling requirements.

o. Post installation testing support requirements.

p. System certification (SIGSEC, TEMPEST, EMC/EMI/RADHAZ, SUBSAFE, etc.) which could be required/affected by accomplishment of the alteration.

q. Non-Destructive Testing (NDT) requirements.

r. Man-aloft requirements.

s. Diver and cofferdam requirements.

t. NSA turned-in equipment/material disposal requirements.

u. Administration support requirements (dedicated telephone service, desk space, etc.)

v. Scaffolding and staging requirements.

w. Entry of OPNAV form 4790/2K for ALT being accomplished.

Whether these requirements are to be provided by the AIT or arrangements are made with the ship, the NSA or another activity for meeting these requirements, they shall remain the responsibility of the AIT. The AIT will provide funding for any required support services to the cognizant activity no later than 30 days prior to the expected start date that the services will be needed.

3.4.3.1 NSA notification of special requirements. When alterations are planned to be accomplished during scheduled ship availabilities, the applicable NSA and the CNO availability

planning activity (normally the Ship Availability Planning and Engineering Center (SHAPEC)) shall be notified of any special requirements which are planned for accomplishment of the alteration as soon as the requirements are identified. Funding for these special requirements shall also be identified. Excepting emergent requirements, the notification shall be provided not later than 180 days prior to the start of the availability to support the contract solicitation process. Funding for support services during a CNO availability shall be provided to the NSA 90 days prior to the start of the availability. To facilitate this process, Appendix B provides a recommended format for the AIT to provide this information to the NSA.

3.4.4 Design shipcheck. In preparation for the design shipcheck (see Appendix E), the AIT shall establish contact with the applicable NSA, or TYCOM to determine acceptable design shipcheck dates. For TYCOMs that hold AIT Scheduling Conferences, the AIT or the AIT Manager should present the proposed shipcheck schedule at the next AIT Scheduling Conference to allow notification of applicable ships and cognizant NSA of the intent to accomplish the alteration. Whether a shipcheck is to be accomplished in or out of a scheduled CNO availability, the AIT shall provide visit clearance information to the cognizant NSA a minimum of five working days or as established by TYCOM policy prior to arrival.

3.4.4.1 Security clearances. Where access is required to secure areas or equipment, the individual design shipcheck team members requiring such access are required to have the proper level of clearance for access without escort. Security clearance information will be provided a minimum of 5 working days prior to arrival or as established by TYCOM policy. The AIT will provide clearance information for design shipcheck team members to the ship, the cognizant TYCOM, cognizant NSA and other appropriate Naval activities.

3.4.4.2 Design shipcheck in-brief. A design shipcheck in-brief shall be conducted upon arrival on board for appropriate members of ship's force and cognizant NSA personnel and, if applicable, the Planning Yard On-Site Representative. The briefing will explain the purpose and extent of the planned alteration(s) and provide an outline of data to be gathered, spaces requiring access, etc.

3.4.4.3 Design shipcheck out-brief. After completion of the design shipcheck, the team shall conduct a design shipcheck out-brief. This briefing will discuss the extent of work required to accomplish the alteration on that ship and the extent of any support that may be required to be provided by the ship. This would include requirements for Pre-Installation Equipment Check-Outs (PICOs), weapons handling, etc.

3.4.5 Incidental material. The AIT shall be responsible for supplying all material other than HCPM, including incidental/expendable (shop stores) material (i.e., tape, solder, welding rods, paint, fasteners, deck covering, insulation, etc.), required to accomplish the alteration.

3.4.6 Material requirements. All material required to be installed/provided as part of an alteration shall be assembled by the AIT for each tasked hull. This material includes all material (HCPM and AIT-procured) required by the installation drawings and all required logistic support items (special tools/test equipment, interim spares, Allowance Parts Lists [APLs], maintenance plans, technical manuals, test procedures, PMS, MAMs, OSI, etc.) required to be turned over to the ship.

a. When ordering AIT-procured material (other than shop stores-type material) from the Federal Supply System, the AIT should first check with the cognizant material item manager to determine whether or not the supply activity has pre-staged or reserved material for the applicable alteration.

b. For ease of accomplishment and reduced on-board effort, prefabrication of material (foundations, cable/harness assemblies, etc.) should be utilized to the maximum extent possible.

c. All SUBSAFE material should be provided with a full set of certification documentation to expedite alteration accomplishment.

d. All SUBSAFE or Level I material which is to be temporarily removed as part of a submarine ALT shall be controlled, stored and protected while removed in accordance with NAVSEA 0924-062-0010 in order to maintain the SUBSAFE or Level I certification of the material.

3.4.7 AIT requirements. The make-up and management of the AIT is the responsibility of the AIT Manager tasked to accomplish the alteration.

3.4.7.1 AIT formulation. The make-up of the AIT shall be as determined by the AIT Manager based on the skill level requirements of the work to be accomplished and the number of shifts the AIT is planned to work. Each AIT will be outfitted with all required hand tools, Personal Protection Equipment (PPE), General Purpose Electronic Test Equipment, special purpose electronic test equipment, installation and check-out spares, special alignment equipment, etc., required to accomplish the alteration. For those skills which require specific training, qualification and/or certification (welding, electrical connector assembly, SUBSAFE, SIGSEC, TEMPEST, PCMS installation, etc.), AIT

members performing these functions shall be fully qualified/certified.

3.4.7.2 AIT On-site Installation Coordinator. Each AIT shall have an AIT On-site Installation Coordinator (military or government employee) designated by, and acting with the authority of the AIT Manager. The AIT On-site Installation Coordinator will have general responsibility for the conduct of the installation. He/she will be the point-of-contact with the ship and the cognizant NSA. AIT On-site Installation Coordinators shall be knowledgeable of and responsible for AIT adherence to all invoked requirements including safety, quality and, when applicable, the SUPSHIP Operations Manual (SOM), Appendix 2-E. For multiple shift operations, AIT On-site Installation Coordinator coverage will be provided for each shift. AITs that do not have an assigned AIT On-site Installation Coordinator (or documented approval from the cognizant SPM that an AIT On-site Installation Coordinator is not required) shall not attempt to accomplish alterations to ships and will be denied access to ships.

3.4.7.3 Participation of other activities. Any participation of a system/equipment ISEA or other activity which is required for accomplishment of required conjunctive or associated ORDALTs, MACHALTs, Field Changes, etc., or for testing or certification of equipment or systems associated with the accomplishment of the tasked alteration(s) shall be coordinated with the AIT.

3.4.7.4 Transportation and billeting. Transport of AIT personnel, tools, material and support equipment to and from the installation site and all billet arrangements shall be the responsibility of the AIT.

3.4.7.5 Security clearances. Where access is required to secure areas or equipment, the individual AIT members requiring such access will have the proper level of clearance for access without escort. A minimum of five working days prior to arrival or as established by TYCOM policy, the AIT shall provide clearance information for AIT members to the ship, the TYCOM, the cognizant NSA, appropriate Naval activities. In situations requiring a quick response, security clearance information will be provided as far in advance as possible by the fastest means practicable. For alterations being accomplished during CNO availabilities, the security requirements of the industrial or naval activity shall also be complied with in addition to those required for access to the ship.

3.4.7.6 Personal Protective Equipment (PPE). Each AIT member is responsible for possessing and properly utilizing PPE while on board a ship and while transiting an industrial area to or from a ship. For alterations being accomplished at an industrial activity, PPE shall meet the requirements of that facility. The

AIT On-site Installation Coordinator shall be responsible for insuring compliance with this requirement by all AIT members. AIT members who do not possess or utilize proper PPE while on board ship or while transiting an industrial area will be required to leave the facility/ship.

a. Footwear. Shoes or boots to be worn on ships should have hard soles with leather or equivalent tops. Water and oil resistant footwear with non-slip soles is recommended. When working on ships on which industrial work is being performed or when transiting through an industrial area to or from the ship, steel toed shoes or boots are required.

b. Head protection. Hardhats meeting OSHA requirements are required to be worn by each individual transiting through an industrial area (shipyard, etc.) or on any ship that has industrial work being performed. The hardhat should have the individual's name and activity printed on it.

c. Hearing protection. Hearing protection (ear plugs, etc.) meeting OSHA requirements is required to be used by each individual entering a high noise area. Hearing protection is required to be carried on the person of each individual transiting through an industrial area (shipyard, etc.) or on any ship that has industrial work being performed.

d. Eye protection. Eye protection (shatter-proof glasses, goggles, etc.) meeting OSHA requirements is required to be used by each individual entering an industrial area (shipyard, etc.) or on any ship that has industrial work being performed.

e. Emergency lighting. An operable flashlight or chemical light stick shall be carried by each AIT member while on any ship that has industrial work being performed.

3.5 Installation Requirements. The performance and completion of shipwork is solely the responsibility of the AIT. The alteration is to be accomplished at the convenience of the ship in accordance with the AIT Task Data (Appendix A) and Alteration Completion Report (Appendix C) and, to the maximum extent possible, on a not-to-interfere basis. Ship's Force will monitor the quality of AIT performance in accordance with CINCLANTFLT/CINCPACFLTINST 4790.3, Volume II, Chapter 3, paragraph 3.6.1.4. All work practices shall conform to the latest version of NAVSEA Standard Items. The AIT On-site Installation Coordinator (paragraph 3.4.7.2 above) and cognizant NSA will assist ship's force in monitoring the quality of AIT performance. The AIT shall fully coordinate all AIT actions with the cognizant NSA. Ship's Force is ultimately responsible for all activities that happen aboard the ship, and provides oversight to all work onboard the ship. This oversight supercedes that of the cognizant NSA or RMMCO. Ship's Force has the authority to

inspect or stop work at any time. AITs are responsible for keeping Ship's Force appraised of the status of their work aboard the ship and any impact it may have on ship's operations or safety. The general procedure for AIT accomplishment of an alteration is as follows:

3.5.1 AIT Check-in and Pre-brief. Each AIT shall check-in with the cognizant NSA and pre-brief the installation prior to reporting to the ship. For availabilities that are conducted within an area controlled by a specific NSA (i.e. availabilities conducted within the physical confines of a shipyard), the AIT shall check in with the cognizant NSA prior to performing work. When work is to be performed on a ship that is outside of an area controlled by an NSA, the AIT shall check in with the activity designated by TYCOM. During this pre-brief, the AIT shall provide a detailed installation plan; and review ILS documentation, special support requirements, ILS deficiencies, System Operation Verification Test (SOVT) requirements (as applicable). During this check-in, the NSA will ensure that the alteration has been approved for installation and that the schedule reflects the AIT's plan. AITs not meeting any of the above requirements will not be allowed to proceed to the ship until satisfactory resolution has been accomplished.

3.5.2 In-brief. An in-brief shall be scheduled and coordinated by the AIT Manager with the cognizant TYCOM, Squadron, NSA and ship. The in-brief shall be conducted upon arrival on board the ship and prior to the initiation of alteration accomplishment. The in-brief shall be conducted as outlined in Appendix F. Whenever possible, for alterations which impact several systems or spaces or will require more than a week to complete, the in-brief shall be held for key personnel prior to the start of alteration accomplishment, coordinated by the TYCOM, NSA or Squadron, as appropriate. Ship's personnel present should include, as applicable:

Commanding Officer	Executive Officer
Operations Officer	Combat Systems Maint Officer
Systems Test Officer (STO)	Combat Systems Officer
Combat Decision Center Officer	Communications Officer
Intelligence Officer	Supply Officer
Maintenance Manager/3-M Officer	Electrical Officer
Associated technical and operational personnel, (e.g. ET, FC, RM, OS, IC, EM ratings, etc., as applicable)	

If the alteration is to be accomplished during a scheduled CNO availability, the NSA, the Planning Yard On-Site Representatives (Program Representative and CDM) and the lead ship availability manager from the industrial activity will also be invited to attend. The AIT will record attendance and minutes of the in-brief and distribute to all attendees. AITs that have not held

an in-brief shall not attempt to accomplish alteration and may be denied access to ship.

3.5.3 Shipwork outside of a CNO scheduled availability. If the alteration is to be accomplished outside of a scheduled ship CNO availability, the AIT On-Site Installation Coordinator shall check in with the cognizant NSA or the TYCOM designated point of contact, and then report to the previously established ship's point-of-contact, the applicable Department Head or Division Officer or the Commanding Officer prior to the arrival of the rest of the AIT and the installation material. Work shall be conducted in accordance with the schedule presented at the in-brief. It will be the responsibility of the AIT to perform required shipwork around restrictions that may be imposed by the ship due to emergent ship's evolutions. Any changes to the work schedule provided to the ship at the in-brief shall be reported to the ship and the cognizant NSA or the TYCOM designated point of contact, as soon as they are identified. The cognizant NSA or the TYCOM designated point of contact, shall be informed of the progress/completion of ship work.

3.5.4 Shipwork during a CNO scheduled availability. If the alteration is to be accomplished during a scheduled CNO availability, the AIT On-site Installation Coordinator shall report to the cognizant NSA prior to the arrival of the rest of the AIT. The previously established ship's point-of-contact will also be contacted. As in the case of work accomplished outside of an availability, the AIT shall be responsible for scheduling work around events occurring as part of the availability. Any changes to the work schedule provided to the NSA and the ship at the in-brief shall be reported to the NSA and the ship as soon as they are identified. The activity accomplishing the availability shall have priority in regard to space access and services (power, cranes, welding, etc.) in support of the availability schedule.

3.5.5 Pre-Installation Equipment Checkout (PICO). For alterations which require modifications to existing systems, the AIT will witness Ship's Force complete a PICO of all applicable systems and equipment prior to modification/relocation to validate the operational status and characteristics of the systems and equipment. Ship's Force testing shall be PMS-based and currently implemented on the ship. Any additional testing shall be the responsibility of the AIT. The PICO report will outline SAT or UNSAT performance and will include known discrepancies and designate the activity responsible for correction. The AIT will provide a copy of the PICO report to the appropriate ship, NSA and TYCOM representatives for record purposes within three (3) working days of PICO completion.

3.5.6 Installations Impacting the Propulsion Plant on Nuclear Powered Ships. Alteration installations which impact portions of

the propulsion plant or designated spaces of nuclear powered ships which are not under the cognizance of the Deputy Commander for Nuclear Propulsion (NAVSEA 08) shall be accomplished as required by NAVSEAINST C9210.4. This instruction, along with its two enclosures (1. List of Propulsion Plan Systems. 2. Areas of Ships Within Which Arrangement Changes Require Prior NAVSEA Approval) provides requirements for implementing changes, repair and maintenance to nuclear powered ships. It defines criteria for work within shipboard nuclear spaces, or in any part of the propulsion plant or the ship that could affect reactor safety or personnel radiation exposure. It also identifies the affected shipboard spaces, areas and systems. When an installation interfaces with one or more of these, the procedural requirements of the instruction, including its attachments, are mandatory. Caution must be exercised as such interfaces are not always readily apparent, and a careful review of this instruction is necessary to determine possible applicability to a work assignment.

3.5.7 AIT On-site Installation Coordinator. Once work has been initiated, the designated AIT On-site Installation Coordinator (paragraph 3.4.7.2) will be responsible for the conduct of the AIT and the resolution of any problems that may arise. When work is to be accomplished during scheduled CNO availabilities, the AIT On-site Installation Coordinator shall attend NSA availability production and coordination meetings. The AIT On-Site Installation Coordinator will provide installation progress and status of accomplishment during production and coordination meetings. NSA's or Ship's Force may report AIT deficiencies to the coordinator verbally or in writing, depending on the severity of the deficiency. AIT On-site Installation Coordinators shall be responsible for correction/resolution of such deficiencies.

3.5.8 Workmanship. Workmanship and work practices shall meet the requirements of all contract specifications including applicable NAVSEA Standard Items. The AIT documented Quality System will include or make reference to procedures that will ensure product conformance. AIT Managers/NSA must ensure AITs have an acceptable Quality System (see paragraph 4.2) prior to commencing installations. AITs without an acceptable Quality System may be denied access to the ship. When tasked, Planning Yards shall participate in AIT installations and production milestones (critical path) to insure conformance to ship specifications and that the installation is accomplished in accordance with design. Planning Yard participation will insure cradle-to-grave conformance to ship standards throughout the entire AIT installation process.

3.5.9 Deactivations. During accomplishment of the alteration, various circuits, pipe runs, equipment, etc., may have to be temporarily deactivated or placed in a reduced operating status. The Commanding Officer's designated representative shall be

notified in writing of equipment and systems that require isolation to accomplish the alteration. This notification shall be provided prior to initiation of ship work so that tag-outs can be accomplished as required by ship's instructions. Notification shall be 48 hours prior to required deactivation to ensure proper coordination with other on-going work. AIT members shall not deactivate or tag-out equipment. The AIT On-site Installation Coordinator will request ship's force or the NSA (for coordination) to deactivate applicable equipment and install tags when tag-out of a system, piping or circuit is required. Deactivated SUBSAFE or Level I material removed as part of a submarine TEMPALT which is intended to be reinstalled when the TEMPALT is removed shall be controlled and stored in accordance with paragraph 3.4.6. NAVSEA Standard Item 009-24 (Isolation, Blanking and Tagging Requirements, Accomplish) provides additional guidance in this area.

3.5.10 Interference removal. Installation of approved alterations often involves removal of interferences to gain access for alteration accomplishment. Removal, reinstallation and testing of temporary interferences shall be in accordance with the requirements set forth in NAVSEA Standard Item 009-23. Systems and equipment requiring permanent modification or relocation to accommodate the alteration are not to be considered interferences but will be considered part of the alteration design.

3.5.11 Housekeeping. The AIT shall perform general housekeeping, including the proper disposal of any hazardous waste, industrial waste or excess hazardous material, in all impacted areas as an on-going part of the alteration accomplishment. At the completion of each shift, each work site shall be broom-cleaned of all debris and trash, including any hazardous waste, industrial waste or excess hazardous material. All material will be properly disposed of. Additionally, the AIT will be responsible for protecting equipment from contamination during the alteration installation process. NAVSEA Standard Item 009-06 (Protection During Contamination-Producing Operations and Maintaining Cleanliness; Accomplish) provides additional housekeeping guidance.

3.5.12 Testing. The AIT will test the alteration and all equipment directly impacted by accomplishment of the alteration in accordance with the approved drawings, test procedures and applicable ship specifications. This includes inspection and testing of all systems impacted by the alteration, including systems which have equipment or machinery removed and reinstalled as interferences. Systems shall be subjected to appropriate testing to demonstrate operational acceptability including SIGSEC, TEMPEST, EMC, SUBSAFE, CPS, etc., as applicable. Such tests will be conducted under conditions simulating normal service conditions as closely as possible. An individual

alteration will not be considered complete until a System Operation Verification Test (SOVT) and/or appropriate systems integration testing are successfully accomplished. The AIT On-site Installation Coordinator shall maintain completed test reports during accomplishment of the alteration. A complete set of the test reports shall be provided to the ship at the completion of the alteration. Testing requirements shall be coordinated with the NSA and the industrial activity (generally beginning at the A-60 time point) for inclusion into an availability Integrated Test Plan/Total Ship Test Plan when shipwork is to be accomplished during a scheduled CNO availability. This will insure that testing requirements do not conflict with other on-going shipwork or present possible personnel safety hazards. The NSA shall be notified prior to all testing events and completed test reports shall be available to the NSA upon request.

3.5.13 Training and ILS. Upon completion of the alteration, any required on-the-job training of assigned members of the ship's crew shall be conducted by the AIT. Training will include both operation and maintenance of all new and modified equipment. All ILS items (including any required interim supported on-board spares that can not be procured by requisition), documentation, and a complete set of redlined installation drawings shall be turned over to the ILO if the ship is in a CNO availability, or directly to the ship if the ship is not in a CNO availability, in accordance with the check off list of Appendix C. For applicable ships, this data, including the Completion Report, may be delivered directly to the local Planning Yard Homeport Representative. Combat System Technical Operations Manual (CSTOM) and Combat System Operational Sequencing System (CSOSS) documentation shall be updated if applicable. Combat system software/firmware and related documentation will be turned over to the designated officer. This includes unclassified and classified programs. Unique On-Board Repair Parts (OBRPs) or interim spares (as applicable), publications (two copies), special test equipment and ship's red-lined drawings, marked to indicate all variances, will be turned over to the appropriate ship's representative. This will allow proper recording of the receipt of the material in the ship's SNAP or other custody files. A completed OPNAV Form 4790/CK, with the Job Control Number (JCN) assigned will be turned over to the Ship's 3-M Coordinator. If planning data was not provided to the ship's CDM prior to the installation, AITs will provide SNAP configured ships with appropriately formatted media through the applicable TYCOM for updating the data base to properly reflect any configuration changes/new repair parts/support requirements that may arise from the alteration. For ships which do not have SNAP installed, appropriately annotated, hard copy Allowance Parts List (APL) pages will be supplied through the TYCOM. This updated information, validated by the AIT, together with ship's representatives, will act as both basis and authority for

generating configuration change information in accordance with OPNAVINST 4790.4 and generating requisitions for supply support deficiencies in accordance with NAVSEA T9066-AA-MAN-010.

3.5.14 Final housekeeping. After completion of all shipwork, the AIT will conduct final housekeeping in all areas involved in the alteration accomplishment. Excepting cryptographic equipment, equipment that is removed as part of the alteration and is to be turned-in for accounting purposes shall be the responsibility of the AIT. Turn-in of cryptographic equipment will be the responsibility of the ship.

3.6 Installation Follow-up.

3.6.1 Out-briefing. After completion of all ship work, the AIT will conduct an out-briefing and will obtain the signature(s) of the ship's designated representative(s) on the Alteration Completion Report (see Appendix C) cover sheet. The NSA and, when applicable, the Local Planning Yard On-Site Representatives (Program Representative and CDM) shall be invited to attend all out-briefs. For alterations accomplished outside of an availability, a joint ship/AIT alteration completion message shall be issued within 72 hours of operational certification. The message will indicate any system interface not demonstrated during operational certification and include all known discrepancies assigned to the responsible activity (i.e., the ship, the AIT, TYCOM, etc.). The alteration completion message is in addition to the Alteration Completion Report required in paragraph 3.7.3 below. If the alteration is accomplished during a scheduled CNO availability, the NSA shall be notified by the AIT of their departure from the alteration site, all outstanding discrepancies and the corrective POA&M indicated in the completion report. All special badges, passes, check-out forms, dosimeters, etc. will be turned-in, as required, in accordance with cognizant NSA requirements.

3.6.2 Drawings developed by the Planning Yard. For alterations where the design drawings are prepared by the Planning Yard, the AIT shall provide a red-line mark-up of the drawings to the ship and the Planning Yard indicating any/all deviations/variances authorized by the Planning Yard to support the actual alteration accomplishment. The redlined drawings shall be forwarded within 15 working days of installation completion. Copies of LARs which authorized the deviations or waivers shall also be forwarded to the Planning Yard. The AIT Manager shall provide funding necessary for the Planning Yard update of design drawings. Unless otherwise agreed to by the SPM and the AIT Manager, the cognizant SPM shall be the only activity to task Planning Yard efforts.

3.6.3 Drawings developed by the AIT. For alterations where design drawings are prepared by the AIT and reviewed and approved

by the Planning Yard, the AIT shall ensure that the approved design drawings are revised to indicate the actual "as installed" configuration on the ship. The ship will receive a redlined copy of the drawings at the time of alteration completion and, when revised, **electronic media copies of the as-built drawings shall be forwarded to the applicable ship and the Planning Yard.**

Copies of any LARs which authorized deviations or waivers from approved designs shall also be forwarded to the Planning Yard.

3.6.4 Ship's Selected Record (SSR) Documentation. The AIT Manager shall provide funding necessary for the Planning Yard update of SSR documentation as directed by the SPM. The actual update of SSR documentation will be accomplished by the Planning Yard as part of the normal SSR update process associated with scheduled ship availabilities. SSR updates for AIT installations accomplished outside of scheduled ship availabilities may be accomplished on an annual basis but shall be accomplished before expiration of AIT funding and if possible be aligned with the normal SSR update process associated with the next scheduled availability of the respective ship. As installed drawings must be received by the planning yard for SSR updates to be accomplished.

3.7 Reporting Requirements. There are a minimum of three reports required from the AIT for each task; a Task Status Report, a Naval Message Completion Report and an Alteration Completion Report. In the event that the Naval Message Completion Report and Alteration Completion Report list installation deficiencies (in Attachment (1) of the report as shown in Appendix C), the ship receiving the installation will send a naval message Final Completion Report when all deficiencies are corrected and the ship accepts the installation as complete. Suggested formats for these naval message reports and the Alteration Completion Report are provided in Appendix C.

3.7.1 Task Status Report. A Task Status Report (monthly or quarterly, as required by the tasking activity) shall be submitted to the AIT Manager with copies to the SPM, applicable TYCOMs, applicable NSA, the LCM and the cognizant Planning Yard. Form and format of Task Status Reports shall be as specified by the tasking activity. For AITs with more than one (1) alteration task from the same Manager, the reports may be combined in the same document, but the data shall be segregated by alteration. Whether tasked by the LCM, the cognizant SPM or another activity, copies of the report will be distributed so that the LCM, the SPM and the cognizant Planning Yard are informed of the progress of the task(s).

3.7.2 Naval Message Completion Report. Upon completion of the installation, the AIT and ship will send a "joint" naval message reporting completion of the effort, plus any deficiencies in the installation and the comments of the ship Commanding Officer

relative to the installation. A sample naval message format for this report is provided in Appendix C.

3.7.3 Alteration Completion Report. The AIT shall forward copies of the Alteration Completion Report (Appendix C) to the applicable TYCOM, Group Commander, Squadron Commander and cognizant NSA within 15 working days of alteration completion. The Alteration Completion Report will include all required signatures and data filled in on all applicable attachments. The AIT will also forward copies of the Alteration Completion Report to the LCM, the cognizant SPM, the ship's CDM, and the cognizant Planning Yard (if the Planning Yard is not the CDM) within 15 working days of alteration completion. For alterations to CV/CVN's, a copy shall also be forwarded to SUPSHIP Newport News (Code 1800); for submarines, to SUBMEPP (Code 1800); for surface ships, to SUPSHIP Portsmouth (Code 900). In addition, the Planning Yard shall also receive a redlined copy of all alteration drawings, marked-up to indicate all variances from the original drawings, as part of the report. Planning Yards will notify the cognizant SPM in the event of non-receipt of an Alteration Completion Report within 30 days of the scheduled completion date initially established in accordance with the provisions of this specification. AIT Activities responsible for relatively large numbers of AIT equipment alteration installations may customize the format of Appendix C as long as all essential information required by the LCM, SPM, CDM, NSLC and Planning Yard for their alterations is included.

3.7.4 Naval Message Final Completion Report. Upon correction of all deficiencies reported in the Completion Report, the ship receiving the alteration installation will send a naval message Final Completion Report accepting the installation as complete. A sample naval message format for this report is provided in Appendix C.

4. QUALITY SYSTEM PROVISIONS

4.1 AIT Responsibilities. The AIT shall provide and maintain a Quality System in accordance with Appendix D. Upon request by the cognizant NSA, AITs will be required to show proof that their Quality System has been accepted by NAVSEA 04XQ or a SUPSHIP office. Additionally, all other contractually related procedures requiring acceptance shall be available to the NSA prior to the start of shipwork when requested.

4.2 Acceptance of the Quality Systems.

4.2.1 Initial Acceptance. Contractors and Government Activities performing AIT work shall submit their Quality System for review and acceptance to NAVSEA 04XQ. The Quality System shall comply with the requirements of Appendix D.

4.2.1.1 SUPSHIP Acceptance. SUPSHIP offices are authorized, if tasked, to review and accept an AIT's Quality System. The SUPSHIP office shall then forward a copy of the acceptance letter to NAVSEA 04XQ for their master files.

NOTE: MSRA and ABR contractors. Contractors performing AIT work who are MSRA or ABR Agreement holders are not required to submit their Quality System to NAVSEA 04XQ, but must maintain a current Quality System that has been accepted by their cognizant SUPSHIP.

4.3 Resubmittal. Upon acceptance by NAVSEA 04XQ or a SUPSHIP office, the Quality System does not require resubmittal or re-acceptance unless changes to technical requirements are made or the AIT contractor's status changes.

5. SPECIFICATION COMPLIANCE

5.1 Performance Inspections/Compliance Audits. The TYCOMs, NSAs, Headquarters Systems Commands (NAVSEA, SPAWAR, NAVAIR), SPMS, LCMs and the Planning Yards will normally perform inspections of installations on a sampling basis and will use the evidence of this sampling as indicating conformance or nonconformance with this specification. In addition, the accepted Quality System will also be subject to periodic compliance audits to the requirements of Appendix D.

APPENDIX A

AIT TASKING DATA

AIT TASKING DATA

- a. The specific alteration(s) covered by the task.
- b. The specific applicable hull(s) covered by the task.
- c. The type of task (alteration design or accomplishment).
- d. Whether NAVSEA 0902-018-2010, NAVSEA S9070-AA-MME-010/-SSN/SSBN, NAVSEA S9AAO-AB-GOS-010/GSO or other general specification is invoked for basic guidance for design, installation, material selection, testing and certification requirements.
- e. The SPM point(s) of contact.
- f. The equipment/system LCM (NAVAIR, NAVSEA, SPAWAR, etc.) point of contact and, when certification in accordance with NAVSEA S9040-AA-GTP-010/SSCR is required, the designated Certifying Authority.
- g. The AIT Manager point of contact (if other than the LCM or the SPM).
- h. The applicable Class Planning Yard(s) points of contact.
- i. Monthly Task Status Reports to the AIT Manager (tasking activity) with copies to all other interested activities (the applicable TYCOMs and NSAs, the SPM, the equipment/system LCM, the applicable Planning Yard[s] and the OPNAV platform and/or program sponsors [when requested], etc.) are required.
- j. Approval requirements for installation design products (SHIPALT installation drawings (SIDs), test procedures, etc.) for installation design tasks.
- k. An Alteration Completion Report (Appendix C) is required upon alteration accomplishment. A Naval message report is also required for accomplishment outside a CNO scheduled availability.
- l. An acceptable Quality System (see Appendix D) is required prior to commencing installations.
- m. The AIT Manager shall ensure that copies of the task (and all subsequent changes) are forwarded to the SPM, the LCM, and the applicable Planning Yard. When copies of tasks are received by the LCM, the LCM will complete AIT checklists and all logistic products required to support the installation, including Allowance Parts lists, Preliminary Allowance Lists, Planned Maintenance System Documentation, Technical Manuals and Changes and forward copies to the AIT for delivery to the ships.

APPENDIX B

AIT SUPPORT REQUIREMENTS CHECKLIST

ALTERATION INSTALLATION TEAM (AIT) SUPPORT REQUIREMENTS CHECKLIST

ALTERATION NUMBER	ALTERATION BRIEF	INSTALLER/SPONSOR
SERVICE REQUIREMENTS CHECK REQUIRED SERVICES AND FILL IN BLANKS FOR REQUIREMENTS		
<input type="checkbox"/> CRANE AND OPERATOR (Number of lifts required): MAXIMUM LIFT HEIGHT REQUIRED: <i>Notes: 1) Maximum crane lift shall not exceed 10,000 pounds..</i>		
<input type="checkbox"/> RIGGING (Mandays required):		<input type="checkbox"/> FORKLIFT (Mandays required): <i>Notes: 1) Maximum lift for the forklift NTE 2,000 lbs.</i>
<input type="checkbox"/> COMPRESSED AIR (List requirements):		
<input type="checkbox"/> STORAGE/LAY-DOWN AREA (List requirements):		
<input type="checkbox"/> OFFICE SPACE: <div style="margin-left: 150px;"> DESKS (Number required): PHONE/FAX/DATA LINES (List requirements): COPIER (List requirements): PARKING SPACES (Number required): </div>		
<div style="display: flex; justify-content: space-between;"> <div> <input type="checkbox"/> TANK WORK (List tanks to be opened): "Remarks") </div> <div style="text-align: right;"> <input type="checkbox"/> Defuel/pump down <input type="checkbox"/> Gas-free <input type="checkbox"/> Defuel/pump down <input type="checkbox"/> Gas-free <input type="checkbox"/> Defuel/pump down <input type="checkbox"/> Gas-free <input type="checkbox"/> Defuel/pump down <input type="checkbox"/> Gas-free <input type="checkbox"/> Defuel/pump down <input type="checkbox"/> Gas-free (Continue on sheet 2) </div> </div>		
<input type="checkbox"/> WELDING SERVICES (Mandays required):		<input type="checkbox"/> FIREWATCH
<input type="checkbox"/> SANDBLASTING/PAINTING SERVICES (Mandays required):		
<input type="checkbox"/> INSULATION/LAGGING SERVICES (Mandays required):		
<input type="checkbox"/> STAGING REQUIRED (List locations):		
<input type="checkbox"/> TEMPORARY ELECTRICAL SERVICES (List locations and requirements):		

SERVICE REQUIREMENTS CONTINUED

CHECK REQUIRED SERVICES AND FILL IN BLANKS FOR REQUIREMENTS

☐ VENTILATION/TEMPORARY AIR CONDITIONING (List requirements):☐ SPECIAL TOOLS (List requirements):☐ OTHER REQUIREMENTS/REMARKS (List):

POINT OF CONTACT FOR THE AIT REPRESENTATIVE:

This Checklist Will Be Submitted to the Cognizant Advanced Planner Before Day
A-minus 135 of the Availability.

APPENDIX C

MESSAGES & REPORTS

CONTENTS

Suggested Naval Message Format for Installation Completion Report	C-2
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SUGGESTED NAVAL MESSAGE FORMAT FOR INSTALLATION COMPLETION REPORT

ADMINISTRATIVE MESSAGE

ROUTINE

R (DTG)

FM SHIP/STATION

TO ISIC

INFO TYPE COMMANDER//N4/N6//

GROUP COMMANDER

NAVAL SUPERVISING ACTIVITY (as applicable)

PLANNING YARD

SHIP'S CONFIGURATION DATA MANAGER (IF OTHER THAN PLANNING YARD)

IN SERVICE ENGINEERING AGENT (ISEA)

LIFE CYCLE MANAGER (LCM)

COMNAVSEASYS COM WASHINGTON DC//04M5/05/PMS444/SPM//

PEO (as applicable)

COMSPA WARSYS COM SAN DIEGO CA//04F//

NAVICP MECHANICSBURG PA//

FTSC (as applicable)

CHET//SURFACE COORDINATOR// (SURFACE COMBATANTS)

SUPSHIPS NEWPORT NEWS VA//1800// (CARRIERS ONLY)

SUPSHIPS PORTSMOUTH VA//900// (SURFACE SHIP ONLY)

SUBMEPP PORTSMOUTH NH//1800// (SUBMARINE ONLY)

Cognizant NSA command

UNCLAS //NO4720//

MSGID/GENADMIN//

SUBJ/(EQUIPMENT/SYSTEM INSTALLATION ON USS SHIP)

RMKS/

1. THIS IS A JOINT (SHIP)/AIT MESSAGE.
2. (EQUIPMENT/SYSTEM) WAS (INSTALLED/MODIFIED/REMOVED) ON (COMPLETION DATE) AND ACCEPTED AS OPERATIONAL WITH/WITHOUT DISCREPANCIES. (List all known discrepancies, responsible activity, and date discrepancy will be completed. If there are no discrepancies, this is the final and only message report required.)
3. FOLLOWING INFORMATION PROVIDED:
 - A. TYPE INSTALLATION:
 - B. ALTERATION NUMBER:
 - C. SYSTEM OPERATION VERIFICATION TESTING (SOVT) CONDUCTED:
 - D. NO CHANGES TO SIDS ARE REQUIRED / SIDS REQUIRE REVISION.
 - E. REDLINE DWGS HAVE BEEN FORWARDED TO THE PY.
 - F. ALTERATION COMPLETION REPORT COMPLETED AND FORWARDED
 - G. EQUIPMENT INSTALLED: NOMENCLATURE, SERIAL NUMBER, 4790/CK JCL
 - H. ILS STATUS STATEMENT (individually listed MAMs to include serial number)
 - I. SUMMARY OF INSTALLATION
4. INSTALLATION ACTIVITY POC
5. COMMANDING OFFICER'S COMMENTS.

SUGGESTED NAVAL MESSAGE FORMAT FOR FINAL COMPLETION REPORT

ADMINISTRATIVE MESSAGE

ROUTINE

R (DTG)

FM SHIP/STATION

TO ISIC

INFO TYPE COMMANDER//N4/N6//

GROUP COMMANDER

PLANNING YARD

SHIP'S CONFIGURATION DATA MANAGER (IF OTHER THAN PLANNING YARD)

LIFE CYCLE MANAGER (LCM)

IN SERVICE ENGINEERING AGENT (ISEA)

COMNAVSEASYS COM WASHINGTON DC//04M5/05/PEOEXW/PMS444/PEO/SPM//

COMSPAWARSYS COM SAN DIEGO CA//SPAWAR 04F//

NAVICP MECHANICSBURG PA//

FTSCLANT/PAC

CHET//Surface coordinator//

SUPSHIPS NEWPORT NEWS VA//1800//

Cognizant NSA command

UNCLAS //NO4720//

MSGID/GENADMIN//

SUBJ/(EQUIPMENT/SYSTEM INSTALLATION ON USS SHIP)

REF/A/RMG/SHIP/STATION/DTG// (ORIGINAL INSTALLTION MSG RPT)

REF/B/DOC/DATE/SERIAL// (AIT INSTALLATION COMPLETION REPORT)

RMKS/

1. THIS IS A FINAL COMPLETION REPORT MESSAGE.
2. (EQUIPMENT/SYSTEM) WAS (INSTALLED/MODIFIED/REMOVED) ON (COMPLETION DATE). ALL DISCREPANCIES LISTED IN REFS A AND B CORRECTED/COMPLETED.
3. INSTALLATION ACTIVITY POC
4. COMMANDING OFFICERS COMMENTS.

ALTERATION COMPLETION REPORT

ALTERATION NO.: _____
ALTERATION BRIEF: _____
CONCURRENT ALTERATION NO.: _____
CONCURRENT ALTERATION BRIEF: _____

SHIP HULL NO.: _____ SHIP NAME: _____
SHIP CLASS: _____ PLANNING YARD: _____
TYPE COMMANDER: _____ SQUADRON/GROUP: _____

SHIP PROGRAM MANAGER (SPM)

Point of Contact: _____

PLANNING YARD

Point of Contact: _____

LIFE CYCLE MANAGER

Point of Contact: _____

INSTALLING ACTIVITY

Point of Contact: _____

NAVAL SUPERVISING ACTIVITY

Point of Contact: _____

INSTALLATION DATES: _____ to _____

SHIPAIT On-site Installation Coordinator_____
(Signature)_____
(Signature)_____
(Printed Name)_____
(Printed Name)_____
(Department/Division)_____
(Department/Division)_____
(Phone)_____
(Date)_____
(Phone)_____
(Date)

This signature does not accept the alteration as complete if there are discrepancies noted in Attachment (1). The Ship shall not accept the alteration as complete until all discrepancies noted in Attachment (1) are corrected, at which time the ship will accept the alteration as complete by Naval message. A suggested message format is provided in this appendix.

DISTRIBUTION:SHIP

Type Commander

Group Commander

Squadron Commander

Naval Supervising Activity(NSA)

AMP FCO

Life Cycle Manager(LCM)

NAVSEA Ship's Program Manager(SPM) and NAVSEA 04M5
In Service Engineering Agent(If different than LCM)
Ship's Configuration Data Manager(CDM)
Planning Yard (if different than the CDM)
SUPSHIP NEWPORT NEWS (Code 1800) (Carriers only)
SUBMEPP PORTSMOUTH NH (Code 1800) (Submarines only)
SUPSHIP PORTSMOUTH VA (Code 900) (Surface Ships only)

ATTACHMENTS: (Circle reports applicable and provided)

- (1) GENERAL REPORT (SHIPALT/TEMPALT ONLY)
- (2) INTEGRATED LOGISTICS SUPPORT VERIFICATION STATEMENT CHECKLIST (ALL INSTALLATIONS)
- (3) END OF INSTALLATION (EOI) ILS REPORT (ALL INSTALLATIONS)
- (4) PHYSICAL CONFIGURATION AUDIT REPORT (ALL INSTALLATIONS)
- (5) TRAINING VERIFICATION STATEMENT (ALL INSTALLATIONS)
- (6) SIGSEC, TEMPEST Visual Report (if applicable [See NSTISSAM TEMPEST/2-95])
- (7) HF ANTENNA INSTLN AND IMPEDANCE REPORT (cover sheet, if applicable [See NAVSEA S9AA0-AA-SPN-010/GEN-SPEC, Sec 400])
- (8) CABLE/CABLEWAY INSPECTION REPORT (if applicable [See NAVSEAINST 9304.1])
- (9) CERTIFICATION TEST FINDINGS/REPORT (if applicable (See NAVSEA S9040-AA-GTP-010/SSCR))

GENERAL REPORT

ALTERATION IDENT: _____
(Type Hull-Class-Alteration Number)

SHIP: _____ ALTERATION ACCOMP DATE: _____
(Hull No./Name) (From - To)

This report documents the proper installation of (SHIPALT/TEMPALT identification). To ensure conformance with quality standards and installation specifications and procedures, a physical installation shipcheck was conducted jointly by Ship's Force and the Alteration Installation Team (AIT) for completion of the various elements of this report. Non-acceptance of an individual element requires that the Remarks line be filled-in by Ship's Force. The AIT will provide a POA&M for completion or correction of all non-acceptance items within five (5) working days of rejection of the individual element. The POA&M will describe the degree of completion or correction required, the lead activity point of contact, and the scheduled completion date. Final completion of discrepancies will be accepted jointly by Ship's Force and the lead installing activity. AIT Coordinator blocks is to be signed by the AIT On-site Installation Coordinator.

1. In-Briefing. An In-Brief by a Government representative was held with Ship's Force and a NSA representative.

Ship's Force _____ AIT Coordinator _____
Remarks: _____

2. Pre-Installation Check-Out (PICO). A PICO was conducted on existing systems/equipment to verify operational status. Testing was conducted by Ship's Force and witnessed by the AIT. PICO report was provided to ship's force representatives within three working days of PICO completion.

Ship's Force _____ AIT Coordinator _____
Remarks: _____

3. Operational and/or operational testing. An equipment operational test and/or System Operational and Verification Test (SOVT) was performed on all equipments/systems impacted by accomplishment of the alteration.

Ship's Force _____ AIT Coordinator _____
Remarks: _____

4. Integrated Logistic Support (ILS). ILS for new equipments was provided and verified (see Attachments 2,3,and 10).

Ship's Force _____ AIT Coordinator _____
Remarks: _____

5. Training. On-the-Job operator and maintenance training for ship's force was conducted and verified (see attachment 5).

Ship's Force _____ AIT Coordinator _____
Remarks: _____

6. Physical Installation Shipcheck. To ensure conformance with quality standards and procedures, the following elements were shipchecked after completion of shipwork:

a. Design conformance. Alteration was accomplished in accordance with the approved alteration drawings provided.

Ship's Force _____ AIT Coordinator _____
Planning Yard Representative _____
Remarks: _____

b. Equipment access. Access to new and relocated equipment is acceptable for operation and maintenance of the equipment including access to connectors where practicable.

Ship's Force _____ AIT Coordinator _____
Remarks: _____

c. Removal items. In addition to items indicated on removal drawings, piping, cabling, mounts, racks, foundations, pipe/cable hangers, etc., which were made unnecessary or redundant as a result of the accomplishment of the alteration have been removed and properly disposed of.

Ship's Force _____ AIT Coordinator _____
Remarks: _____

d. Structural installation. All structural work (deck/bulkhead modifications, foundations, etc.) is satisfactory in terms of workmanship, fit, function, preservation and finish.

Ship's Force _____ AIT Coordinator _____
Remarks: _____

e. Piping installation. All piping work (pipe modifications, valves, pipe fittings, etc.) is satisfactory in terms of workmanship, fit, function, preservation and finish.

Ship's Force _____ AIT Coordinator _____
Remarks: _____

f. Cabling. Cabling is satisfactory in terms of type, function, workmanship, designation and marking, cable shield grounding, cable entry into equipment, penetrations (including coamings), routing (including avoidance of interferences with equipment or personnel/material movement), acceptable bending radius and finish.

Ship's Force _____ AIT Coordinator _____
Remarks: _____

g. Cableways. Cableway work (hangers, supports and trunks) is satisfactory in terms of workmanship, clearances, spacing, new hanger/support installation (when required), fit and finish. New banding has been applied to all new or disturbed hangers.

Ship's Force _____ AIT Coordinator _____
Remarks: _____

h. Wiring. Wiring is satisfactory in terms of workmanship, designation and marking, terminal lug application (proper type, size, and attachment process [crimp/solder]), sufficient wire length, signal shield terminations, and wire routing within equipment.

Ship's Force _____ AIT Coordinator _____
Remarks: _____

i. Connectors. Connector work is satisfactory in terms of workmanship, connector selection, connector assembly (fully pinned with proper pin type, size, and attachment process [crimp/solder]), sufficient wire length, backshell application (type, assembly, cable shield termination, strain relief, etc.), and accessibility.

Ship's Force _____ AIT Coordinator _____
Remarks: _____

j. Grounding and bonding. Grounding and bonding requirements for safety, TEMPEST, and electromagnetic interference (EMI)/intermediate modulation interference (IMI)/radio frequency interference (RFI) have been observed and properly applied and is satisfactory in terms of workmanship, fit, function, preservation and finish.

Ship's Force _____ AIT Coordinator _____
Remarks: _____

k. Labels and label plates. New labels and label plates have been installed where required (piping, valves, equipment, racks, switch/patch boards, panels, connection boxes, etc.). Existing labels and label plates removed or damaged during accomplishment of the alteration and requiring restoration or relocation have been restored. Labels and label plates are properly applied and are satisfactory in terms of workmanship, type, fit, function and finish.

Ship's Force _____ AIT Coordinator _____
Remarks: _____

l. Compartment marking. Existing compartment marking removed or damaged during accomplishment of the alteration and requiring restoration or relocation have been restored in accordance with NAVSEA S9086-CN-STM-020/CH-79 V2 and NAVSEA S9086-RK-STM-010/CH-505. Marking is properly applied and is satisfactory in terms of workmanship, type, fit, function and finish.

Ship's Force _____ AIT Coordinator _____
Remarks: _____

m. Impacted equipment condition. Equipment installed or relocated as a result of the alteration accomplishment have been tested and demonstrated to be operational and free from defects. Equipment or components removed and reinstalled as interferences are in at least an "as-found" condition. Interference items which were operational prior to removal have been tested and have been demonstrated to be operational and free from defects. (See NAVSEA Standard Item 009-23)

Ship's Force _____ AIT Coordinator _____
Remarks: _____

n. Clean-up. Chips, shavings, refuse, dirt, fluids (including water), and all scrap and other foreign material, including hazardous waste, industrial waste and excess hazardous material produced as a result of the accomplishment of alteration have been removed from spaces and areas impacted by the alteration. Operational spaces, tanks and unoccupied spaces and compartments have been left "broom clean".

Ship's Force _____ AIT Coordinator _____
Remarks: _____

o. Out Briefing. An Out Brief by a Government representative was held with Ship's Force and an NSA representative.

Ship's Force _____ AIT Coordinator _____
Remarks: _____

7. Redline Drawings. Redline drawings will be forwarded to the planning yard within 15 working days.

Ship's Force _____ AIT Coordinator _____
Remarks: _____

8. Correction of Discrepancies (if required). POA&M(s) for discrepancies noted above is(are) as follows:

Ship's Force _____ AIT Coordinator _____
Remarks: _____

AIT ILS VERIFICATION STATEMENT CHECKLIST
COMPLETION INSTRUCTIONS

1. The AIT Checklist must be completed for all Ship Alterations (SHIPALTs), TEMPALTs, Ordnance Alterations (ORDALTs), Engineering Changes (ECs), Field Changes (FCs), Machinery Alterations (MACHALTs), and all other configuration changes accomplished by an Alteration Installation Team (AIT). An AIT is a Navy activity (military, government civilian or civilian contractor, including shipyard TIGER teams and intermediate maintenance activities) tasked and supervised by a Headquarters/Hardware Systems Command (HSC) or Type Commander (TYCOM). AITs are trained and equipped to accomplish approved shipboard installations and modifications, including Alterations Equivalent to Repair (AERs), on specific ships.
2. Specific completion instructions are as follows:
 - a. Annotate items that do not apply as "NA" (Not Applicable).
 - b. To report ILS verification for multiple ALTs accomplished on single system/equipment the use of a matrix highlighting applicability of each checklist item is authorized.
 - c. For AIT installs completed outside of Integrated Logistics Overhaul (ILO) or Integrated Logistics Review (ILR), complete Section I only.
 - d. For AIT installs completed during an Integrated Logistics Overhaul (ILO) or Integrated Logistics Review (ILR), complete Section II only.
 - e. For ships in ILO/ILR but not co-located with the ILO, complete Section I only.
 - f. Obtain signature of authorized acting personnel or equivalent duty personnel in absence of designated individual. Command Duty Officer (CDO) will be point of contact if dept. head/dept. duty officer is not available. Prior to certifying delivery of ILS products, ship's authorized agent must verify ILS products listed in the Logistics Support Products provided to Ship were delivered.
 - g. All AITs must check-in/check-out with applicable NSA before and after install.
 - h. Use the EOI ILS REPORT (Attachment 3 of this Appendix) to list all Logistics Support Products Provided to Ship, (Technical manuals by identification number, MIPs/MRCs by number, Test Equipment by SCAT code, APL/AELs by number, with LSSC status indicated and listing of all material being delivered by category [OBRPs, MAMs and OSI by NSN or P/N]).
 - i. Prepare an Exception Report for deficient ILS, identifying the activity responsible for providing deficient ILS and expected delivery date.
3. The completed checklist and EOI ILS Document shall be attached to the Completion Report. A copy of the completed checklist and EOI Document will be forwarded to Naval Sea Logistics Center (NSLC) Code N54.

SECTION I - AIT Installations Completed Outside of an ILO/ILR

AIT CHECKLIST ALT Type/#: Date: _____ Ship: _____ Installing Activity: _____	PRINTED NAME SIGNATURE	RATE / RANK	DATE
CHECK-IN: Appropriate NSA signature required: (i.e., C-HET, Port Engineer, Maintenance Manager, Squadron Maintenance Officer or Regional Maintenance Center) depending upon ship type/location.			
WORK CENTER/DEPT. Ship's Dept. Head (Or Acting) Signature Required.*			
Deliver special tools and special test equipment to Work Center. ¹			
Certify copies of Tech. Manuals and Manufacturer Manuals for COTS/NDI have been provided to Work Center. ^{1,2,3}			
Deliver Operational Sequencing System (OSS) documentation to Work Center. ³			
Deliver Software Programs to Work Center. ³			
Deliver or provide On-Board Training (OBT) to ship's crew, if applicable.			
SUPPLY OFFICER Ship's Dept. Head (Or Acting) Signature Required.*			
Deliver MAMs and associated supply/material support data listings ⁴ to SUPPO for sub-custody to appropriate work center in accordance with TYCOM directives.			
Deliver repair parts (OBRPs) and a copy of associated supply/material support data listings to SUPPO. ^{1,4}			
If Automated Shore Interface (ASI) tape or disk accompanied by TYCOM cover letter is provided, deliver to SUPPO with processing inst.			
Provide SUPPO a listing of all MAMs removed from the Work Center. SUPPO document transfer of MAMs to AIT rep. on DD1149 expenditure document.			
Provide SUPPO a listing of all upgraded MAMs in the Work Center including a cross reference of old to new part number and stock numbers.			
Deliver hard copy allowance documentation (APLs/AELs) to SUPPO for SNAP I ships (optional if data included in SNAP II). ¹			
Certify PMS documentation (MIPs/MRCs) has been provided to the Work Center and 3M office.			
Deliver SSRD markups and redlined installation drawings to SUPPO. ^{1,3}			
Certify additional copies of Tech. Manuals have been provided to 3M Coordinator. ^{1,2,3}			
3M COORDINATOR 3M Coordinator signature required.*			
Deliver completed 4790/CKs for all configuration alterations (adds, deletes and modifications) to the 3M Coordinator (copy to NSA) if not entered into SNAP. If entered in SNAP, provide applicable data to both 3M Coordinator and NSA. ¹			
JCN			

AIT CHECKLIST ALT Type/#: _____ Date: _____ Ship: _____ Installing Activity: _____	PRINTED NAME	RATE / RANK	DAT E
	SIGNATURE		
CHECK-OUT: Appropriate signature required from cognizant ships force Department Head, Supply Officer or 3M Coordinator. Final check-out signature is NSA.			

* The Command Duty Officer (CDO) will be the point of contact if the dept. head/dept. duty officer is not available.

¹For CV/CVNs deliver to Maintenance Support Center (MSC). MSC signature required. The authorized acting personnel in the absence of the designated individual are the Combat System Officer of the Watch (CSOOW).

²Technical manuals provided in electronic media format (CD-ROM) must be loaded into the Advanced Technical Information System (ATIS).

³For AEGIS ships Combat Systems material, deliver to Combat Systems Maintenance Central (CSMC) Systems Test Officer (STO). STO signature required. For HM&E material, deliver to Central Control Station (CCS).

⁴SNAP is the only official source of configuration and supply data. This list is for the administrative use of the AIT only. In the event of a conflict between the list and SNAP, SNAP always takes precedence.

SECTION II - AIT Installations Completed During an ILO/ILR

AIT CHECKLIST ALT Type/#: Date: _____ Ship: _____ Installing Activity: _____	PRINTED NAME	RATE / RANK	DATE
	SIGNATURE		
CHECK-IN: Appropriate NSA signature required: (i.e., C-HET, Port Engineer, Maintenance Manager, Squadron Maintenance Officer or Regional Maintenance Center) depending upon ship type/location.			
WORK CENTER/DEPT. Ship's Dept. Head (Or Acting) Signature Required.*			
Deliver special tools and special test equipment to Work Center.			
Deliver Operational Sequencing System (OSS) documentation to Work Center. ³			
Deliver Software Programs to Work Center. ³			
Deliver or provide On-Board Training (OBT) to ship's crew, if applicable.			
SUPPLY OFFICER Ship's Dept. Head (Or Acting) Signature Required.*			
SUPPO document transfer of MAMs to AIT rep. on DD1149 expenditure document.			
FLTILOTEAM Logistics Management Specialist signature required.*			
Deliver SSRD markups and redlined installation drawings to FLTILOTEAM. ^{1,3}			
Certify all Tech. Manuals have been provided to FLTILOTEAM. ^{1,2,3}			
Deliver MAMs and associated supply/material support data listings ⁴ to FLTILOTEAM. A copy shall be provided to SUPPO for sub-custody to appropriate work center in accordance with TYCOM directives.			
Deliver repair parts (OBRPs) and associated supply/material support data listings ⁴ to FLTILOTEAM.			
Provide FLTILOTEAM a listing of all MAMs removed from the Work Center.			
If Automated Shore Interface (ASI) tape or disk accompanied by TYCOM cover letter is provided, deliver to FLTILOTEAM with processing instruction.			
Provide FLTILOTEAM a listing of all upgraded MAMs in the Work Center including a cross reference of old to new part number and stock numbers.			
Deliver hard copy allowance documentation (APLs/AELs) to FLTILOTEAM. ¹			
Certify PMS documentation (MIPs/MRCs) has been provided to FLTILOTEAM.			
Deliver completed 4790/CKs and 2Kilos for all configuration alterations (adds, deletes and modifications) to the FLTILOTEAM or appropriate NSA			

AIT CHECKLIST ALT Type/#: _____ Date: _____	PRINTED NAME	RATE / RANK	DATE
Ship: _____ Installing Activity: _____	SIGNATURE		
CHECK-OUT: Appropriate signature required from cognizant ships force Department Head, Supply Officer or 3M Coordinator. Final check-out signature is NSA.			

* The Command Duty Officer (CDO) will be the point of contact if the dept. head/dept. duty officer is not available.

¹For CV/CVNs deliver to Maintenance Support Center (MSC). MSC signature required. The authorized acting personnel in the absence of the designated individual are the Combat System Officer of the Watch (CSOOW).

²Technical manuals provided in electronic media format (CD-ROM) must be loaded into the Advanced Technical Information System (ATIS).

³For AEGIS ships Combat Systems material, deliver to Combat Systems Maintenance Central (CSMC) Systems Test Officer (STO). STO signature required. For HM&E material, deliver to Central Control Station (CCS).

⁴SNAP is the only official source of configuration and supply data. This list is for the administrative use of the AIT only. In the event of a conflict between the list and SNAP, SNAP always takes precedence.

EXCEPTIONS TO ILS VERIFICATION

ALTERATION IDENT: _____
(Type Hull-Class-Alteration Number)

SHIP: _____ ALTERATION ACCOMP DATE: _____
(Hull No./Name) (From - To)

INSTALLING ACTIVITY: _____

1. The following ILS was not provided upon completion of this alteration:

a. Technical Manuals (listed by identification number and equipment application).

b. Spares Support that is without RIC/PAL No./Interim Repair Parts (listed by Equipment Nomenclature)

c. COSAL Updates (list documentation not onboard)

d. Test Equipment and MAMS (listed by Equipment Nomenclature)

e. PMS Documentation (listed by Maintenance Index Pages (MIPs), Maintenance Requirements Card (MRC) Numbers)

f. SSRD Markups (list mark-ups not onboard)

g. Installation Drawings (list drawings not onboard)

2. The following information is provided for items indicated in paragraph (1):

a. Information on how and when this missing ILS was ordered (i.e. Requisition Number, Letter/Transmittal Number, etc.).

b. Information on the current status/estimated receipt date/reason for late arrival (if known) (i.e. out of stock, not developed, etc.).

c. Information on the anticipated method of transfer to the ship when received (i.e. transshipment, forwarding letter, to be accomplished by someone other than NSA/AIT, etc.)

4720

Ser XXX/XXXX

From: INSTALLING ACTIVITY
 To: APPLICABLE SPM

Subj: EOI ILS REPORT FOR USS() OF ()2000

Encl: (1)Alteration ILS Summary
 (2)Onboard Repair Parts Summary

1. Provision of the following logistic support products is certified in accordance with 9090-310C Certification criteria:

ALT	EQUIPMENT	OPNAV 4790/ CK	S N A P	U P D A T E	R E P A I R	P A R T S	T E C H C	D O C	P M S	T E S T	E Q U I P

LEGEND:

C - COMPLETE - ENCL (1) AND ATTACHMENTS THERETO PROVIDE ILS STATUS

I - INCOMPLETE - ENCL (1) PROVIDES STATUS OF INCOMPLETE ACTIONS

N - NOT APPLICABLE - ALTERATION DOES NOT IMPACT ILS

2. Activity Name, Code point of contact is _____, Commercial (XXX)XXX-XXXX/DSN XXX-XXXX, or Commercial (XXX) XXX-XXXX/DSN XXX-XXXX.

By direction

Copy to:

COMNAVSEASYS COM (PMS 444)

TYCOM

Cognizant NSA

ISEA

CDM

PLANNING YARD

NAVSEALOGCEN (CODE N54)

FLTILOACT/FTSCPAC (if applicable)

CHET (if applicable)

USS ()

Attachment (3)

ALTERATION ILS SUMMARY FOR USS _____

SHIP IS SNAP I _____ SNAP II X NON SNAP

	STATUS	NOTE
1. Updated SNAP Data Base		
2. Provided Push Spares to Supply Department		
3. Provided ADD/DELETE List for On board Repair Parts (OBRPs)		
4. Provided COSAL SOAPL update information (NON SNAP ONLY)		
5. Provided COSAL Part I Sections A & B update information (NON SNAP ONLY)		
6. Provided Hard Copy APL as indicated below		
7. Provided Technical Documentation identified on page __		

Following APL's were provided and/or deleted:

<u>ALT</u>	<u>APL NUMBER</u>	<u>LSSC</u>	<u>EIC</u>	<u>DATE</u>	<u>MOD FLSIP</u>	<u>.25 FLSIP</u>	<u>.50 FLSI P</u>	<u>APL ADD /DEL</u>
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NOTES: (1) SNAP DATA BASE UPDATED BY JSN'S: PENDING TRANSACTION REPORT IS ATTACHED.
(2) SNAP DATA BASED UPDATED BY JSN'S: _____ (3) SKELETONIZED CK PROVIDED TO SHIP FOR UPDATING SNAP.
(4) PROVIDED SKELETONIZED CKS FOR GENERATION OF TYPE 2 CONFIGURATION RECORDS BY SHIP'S COMPANY. COPIES OF CKS ARE ATTACHED

REMARKS:

ONBOARD REPAIR PARTS SUMMARY

ALT NO.	PART NUMBER	NSN	NOMENCLATURE	ADD		DELETE		APL	NOTE
				QTY	ONBD	QTY	REMVD		

- NOTES:
- (1) PART SHOULD BE REQUISITIONED BY THE SHIP

(2) SRI PUSHED BY ALTERATION

(3) OSI/MAM PUSHED BY ALTERATION

(4) ITEM DELETED FROM ALLOWANCE PART LIST/REMOVED SEE PAGE

(5) PART MODIFIED SEE PAGE FOR DETAILED INFORMATION

(6) NON ALLOWED PUSH ITEM SHIP TO STOCK AS AT7 (NON DLR) OR AT5 (DLR)

MODIFIED SPARES

MODIFIED	PART NUMBER	NSN	NOMENCLATURE	SER	QTY	O/B	ALT	APL	NOTE
FROM									
TO									
FROM									
TO									
FROM									
TO									
FROM									
TO									

Remarks: (1)

REMOVED MATERIAL

THE FOLLOWING MATERIALS WERE REMOVED FROM THE EQUIPMENT ONLY AND
RETURNED TO:
(SEE BELOW)

ALT	PART NO.	NSN	NOMENCLATURE	QTY	NOTE

NOTES: (1) DISPOSITION CODES

PHYSICAL CONFIGURATION AUDIT REPORT

ALTERATION IDENT: _____
(Type Hull-Class-Alteration Number)

SHIP: _____ ALTERATION ACCOMP DATE: _____
(Hull No./Name) (From - To)

INSTALLING ACTIVITY: _____

EQUIPMENT NOMENCLATURE _____

SERIAL NO.: _____

LOCATION: _____

EQUIPMENT DISPOSITION:

___ INSTALLED ___ REMOVED ___ MODIFIED

EIC NO.: _____

4790/CK JCN: _____ (4790/CK ATTACHED)

TECHNICAL MANUAL(S): _____
(New/Revised/Copies)

APL/AEL/PAL: _____

TEST EQUIPMENT: _____

PMS DOCUMENTATION: _____ (MIP NO.)

REMARKS:

TRAINING VERIFICATION STATEMENT

ALTERATION IDENT: _____
(Type Hull-Class-Alteration Number)

SHIP: _____ ALTERATION ACCOMP DATE: _____
(Hull No./Name) (From - To)

INSTALLING ACTIVITY: _____

1. It is hereby verified that on-the-job operator and maintenance training has been provided to the ship for equipments installed as part of the above alteration as follows:

OPERATOR TRAINING:	NAME	SIGNATURE
--------------------	------	-----------

(Equipment)		
(Equipment)		

MAINTENANCE TRAINING:	NAME	SIGNATURE
-----------------------	------	-----------

(Equipment)		
(Equipment)		

2. Formal training for this equipment is available as follows:

Course No. _____	Course No. _____
CIN _____	CIN _____
Quota Control _____	Quota Control _____
Training Act _____	Training Act _____
Length _____	Length _____
NEC _____	NEC _____
Phone No. _____	Phone No. _____

APPENDIX D

ALTERATION INSTALLATION TEAM (AIT) QUALITY SYSTEM REQUIREMENTS

ALTERATION INSTALLATION TEAM (AIT)
QUALITY SYSTEM REQUIREMENTS

The AIT shall provide and maintain a documented Quality System to ensure product conformance to contractual requirements. The system shall, as a minimum, comply with the requirements of NAVSEA Standard Item 009-04 and all additional contract requirements.

NOTE: This will provide for the same level of quality assurance required for private sector industrial facilities under Master Ship Repair Agreements (MSRA) and Agreement for Boat Repairs (ABR).

1. General. The AIT shall maintain a quality system which will assure that all supplies and services provided for the accomplishment of alterations to ships conform to contract or task requirements whether manufactured or provided by the AIT, or procured from contractors or vendors. The quality system shall apply to supplies and services provided for the accomplishment of alteration to ships whether the alteration is a permanent change to the ship (SHIPALT), an equipment alteration (Field Change, Ordnance Alteration [ORDALT], etc.) or a temporary alteration (TEMPALT). The AIT shall perform or have performed the inspections and tests required to substantiate product conformance to approved design drawings, specifications, and contract or task requirements and shall also perform or have performed all inspections and tests otherwise required by applicable SHIPALT Records, installation drawings, contract or tasking documentation.

The Quality System shall include the following additional requirements, clarifications, and processes for:

1.1 Master Test Plans (MTPs). MTPs describe test objectives and the inspections and tests to be conducted to verify compliance with specifications and operating requirements to verify proper operation of impacted systems, equipment and interfaces after completion of shipwork. An MTP shall be prepared for each alteration (permanent or temporary), shall be prescribed by clear, complete and current instructions and shall be developed in conjunction with the Planning Yard, the system/equipment Life Cycle Manager (LCM) and the responsible In-Service Engineering Activity (ISEA). During accomplishment of an alteration, associated MTPs shall be provided to the ship, and the cognizant NSA.

1.2 Test Procedures (TPs). Equipment-unique TPs shall be obtained from the system/equipment LCM or the responsible ISEA

and shall cover in detail the procedures for accomplishment of each of the equipment unique tests required to demonstrate the proper operation of all equipment impacted by accomplishment of the alteration. This includes all equipments which were modified or relocated as a result of the accomplishment of the alteration. Testing will be adequate to demonstrate compliance with applicable installation certification requirements (SIGSEC, TEMPEST, RADHAZ/EMI/EMC, SUBSAFE, etc.). When TPs are not available from the system/equipment LCM or the responsible ISEA, the AIT shall develop the equipment unique TPs based on technical manual information and direct coordination with the responsible ISEA, Planning Yard and Class Planning SUPSHIP.

1.3 Process Controls. Process control procedures shall be an integral part of the quality system. In addition to process controls that may be required by the SHIPALT Record, installation drawing, or contract or tasking documentation, the AIT will provide and maintain such process controls as are necessary to assure the quality of shipwork. As a minimum, process controls shall include the following:

1.3.1 Design product control procedures. The AIT's design product control procedures shall cover:

- a. Assignment of responsibility for detail examination, review, and internal approval authority for AIT design products.
- b. Required qualifications of personnel performing detail examination, review, and approval of AIT design products.
- c. Procedural flow of design drawings and other associated documentation.
- d. Checklists to be used in the detail examination and review of design products. The checklists shall specify each examination to be performed to verify conformance of products to the applicable specifications.
- e. Method of safeguarding classified information.
- f. Methods providing for the prevention and ready detection of discrepancies and for timely and positive corrective action.
- g. Method of safe storage of Master File Drawings, reference drawings, and other ship design documentation.
- h. Methods providing for controlled issue of design drawing copies, both reproducible and non-reproducible.

1.3.2 Installation process control procedures. Instructions shall be developed which identify requirements necessary to preclude damage to the ship or injury to personnel during the accomplishment of shipwork. These instructions shall include, but are not limited to:

- a. Control of Magnetic Material.
- b. Material Storage at the work site.
- c. Storage and use of hazardous materials including:
 - (1) Control of respirable fibers from man-made mineral fiber thermal insulating material during insulation and lagging operations.
 - (2) Control of fluorocarbons when utilized aboard ship.
 - (3) Control of MIL-H-19457 and MIL-H-22072 hydraulic fluid when utilized aboard ship.
 - (4) Control, clean-up, and disposal of PCBs.
 - (5) Control, clean-up, safety precautions, and environmental precautions for organotin.
 - (6) Initial monitoring, daily monitoring, and control of insulation and lagging operations.
- d. Fire prevention.
- e. Sight and hearing protection.
- f. Material for staging and screening, temporary covers and shelters.
- g. Installation of cofferdams, patches, and shaft wraps.
- h. Hotwork including:
 - (1) Determination of gas-Free status and for control of hot work safety. (Note: AITs are required to use an OSHA certified marine chemist for entry into confined spaces.)
 - (2) Welding, brazing, and inspection operations (one for each operation).
- i. Uncrating/unpacking of equipment.
- j. Storage and use of tools and test equipment.

- k. Protection of pipes, cables, and equipment during shipwork.
- l. System or equipment de-activation/reactivation.
- m. Control of connector fabrication.
- n. Workmanship. As a minimum, workmanship shall comply with all contract specifications including applicable NAVSEA Standard Items.

NOTE: Procedures required to control processes in the Safety and Environmental area, are not required to be submitted as part of the written Quality System.

1.4 Personnel Certifications. Procedures shall be maintained to assure personnel certifications that may be required to perform shipwork, depending on the work to be accomplished. These certifications include, but are not limited to, the following:

a. Hot work.

(1) Competent Person - Department of Labor Form OSHA 73, Designation of Competent Person(s) for each certified member of the AIT and designation of the certified Marine Chemist(s) responsible of preparing certificates.

(2) Firewatch personnel. Certificates of training for fire watch standing.

(3) Tank cleaning personnel. Certificates of safety practices training for tank cleaning personnel.

(4) Persons performing hot work. Certification(s) of qualification for performance of applicable hot work.

(5) Test personnel qualification. Certification(s) of qualifications for nondestructive testing personnel.

b. Insulation work.

(1) Qualified Person. Provide written designation of the Qualified Person who will take and count samples, monitor personnel, inspect, and certify affected areas are safe to enter.

c. Fluorocarbon use.

(1) Qualified/Competent Person. Certification of the person who will monitor atmosphere, inspect and certify

spaces are safe to enter, and who will supervise these activities.

d. Electrical/Electronic Connector Work.

(1) Qualified personnel. Certification of qualification for all Connector Fabricators, Connector Fabricator Supervisors and Connector Fabrication Quality Assurance Inspector(s).

e. Accomplishment of Nondestructive Testing (NDT).

(1) Qualified personnel. Certification of qualifications for all certified NDT inspectors in the applicable NDT method/methods to be employed.

f. Painting of Critical Surfaces.

(1) Qualified personnel. Certification of qualification for all certified coating inspectors and painters/blasters.

g. Entry into Confined Spaces. Provide written designation of the OSHA certified marine chemist who will inspect atmosphere of confined spaces prior to entry.

h. SUBSAFE work. Workers require qualification and/or certification.

i. ESD Work. Workers require ESD qualification.

j. PCMS Work. Workers require qualification/certification.

1.5 Headquarters Centrally Provided Material (HCPM)

1.5.1 Receipt of HCPM. Provide for receipt of HCPM as follows:

a. When the HCPM is received directly, one signed copy of the Shipping Document (DD Form 1348-1) and one signed copy of the Government Bill of Lading (GBL) shall be retained by the AIT.

b. The HCPM shall be inspected immediately upon receipt to verify conformance with description and requirements, verification of quantity and for possible damage.

c. Notification of the shipping activity of any damage immediately after inspection. Also notify the Headquarters equipment manager and the cognizant SPM if the damage is more than superficial.

d. If the HCPM is electronics equipment, the AIT shall provide testing and calibration of the equipment to verify that the equipment meets operational specifications.

1.5.2 Records of HCPM. Maintain records of the receipt and disposition of each item of HCPM.

1.6 Configuration Status Accounting. Depending on the program, the AIT may be tasked to maintain configuration records of equipment and software so that the ship and equipment managers can maintain configuration control. If configuration status accounting is tasked, the material control process shall provide the following:

1.6.1 Equipment accounting. For each individual equipment (not material) which is received as HCPM or ordered or fabricated by the AIT which is intended to be installed aboard ship, provide and maintain a computerized index of purchase orders, modifications accomplished and final disposition.

1.6.2 Software accounting. For each software item which is to be installed in shipboard equipment, provide and maintain a computerized index of purchase orders, modifications accomplished and final disposition.

1.6.3 Weight Accounting. Depending on the program and the ship class, the AIT may be tasked to maintain a written record of equipment and material removed (weight and installed location) which are not indicated on removal drawings to allow the ship and equipment managers to maintain an accounting of weight changes on weight critical ships. Generally this includes the removal of unused or dead-ended cables, the removal of unused foundations or the removal of unused equipment with associated cables and foundations when such removal is authorized by the ship, the cognizant NSA and approved by the SPM. The material control process shall provide procedures for weight accounting and reporting to the cognizant Planning Yard when required.

APPENDIX E

GUIDANCE FOR DESIGN SHIPCHECKS

GUIDANCE FOR DESIGN SHIPCHECKS

1. General. The purpose of the design shipcheck is to gather as much relevant information as possible about the existing configuration of shipboard equipment, systems and compartments that may be impacted by the accomplishment of an alteration. The information should be as complete and accurate as possible in order to prevent the development of inaccurate or inadequate alteration design or the requirement for a second shipcheck of the ship to gather additional data. Design shipchecks shall be conducted at the ship's convenience on a not-to-interfere basis. Ship availability dates shall be coordinated between the activity developing the installation design and the respective TYCOMs/cognizant NSA.

1.1. Planning Yard participation. When an AIT is performing a design shipcheck in support of the accomplishment of a SHIPALT, participation by the Planning Yard may also be required as specified in the contract or tasking documentation. When Planning Yard participation is required by the contract or tasking documentation, funding for that participation shall be provided by the AIT Sponsor. When the Planning Yard does not participate in an AIT design shipcheck for accomplishment of a SHIPALT, the AIT shall issue a Shipcheck Report to the Planning Yard to allow coordination with other SHIPALT designs that may be under preparation for the applicable ship. Shipcheck Reports are not required to be submitted by AITs for design shipchecks in support of accomplishment of TEMPALTs unless specified in the tasking documentation.

2. Design shipcheck materials. Typical materials that should be considered for a design shipcheck are as follows:

a. Paper prints of the arrangement of equipment and associated foundations and the structural fabrication drawings (when significant bulkhead, deck or overhead work is anticipated) of areas associated with the alteration, ventilation system drawings (when modification of the ventilation duct system is anticipated), cableway fabrication drawings, power system distribution diagrams and system diagrams of all systems expected to be impacted by the accomplishment of the alteration [including Command, Control, Communications, Computer, Intelligence, Surveillance and Recognizance (C4ISR) systems, lighting systems, Interior Communications (IC) system, or support systems (heating, ventilation and air conditioning (HVAC) systems, cooling water system, lubricating oil system, etc.)]. If modifications to electronics cooling water or HVAC systems are considered a possibility, piping diagrams of these systems should also be

taken. Include a diagram that indicates the location of the applicable spaces relative to the total ship.

b. Copies of all correspondence between shipcheck activity and TYCOM/cognizant NSA, Squadron/Industrial Activity, and Ship that discuss the shipcheck, including the forwarding of security clearances, and any special arrangements/requirements.

c. Courier pass for carrying classified drawings/-photographs and/or videotapes to and from the site.

3. Procedure. The following is a general procedure that may be used to conduct a design shipcheck on an active fleet ship. During conduct of the shipcheck, all members of the shipcheck team shall wear identification badges, prominently displayed at all times. If the shipcheck is to be conducted on a nuclear ship, each member of the shipcheck team is to wear a thermal luminescent device (TLD), or other radiation-detection device, as directed by the applicable squadron, group or Naval Supervising Activity (NSA).

3.1. Advance Notification. Officially request the TYCOM/cognizant NSA to assign a date for access to the ship to be shipchecked. For TYCOMs which hold AIT Scheduling Conferences, the AIT activity or the AIT Manager should present the proposed shipcheck schedule at the next conference to allow advance notification to applicable ships and the cognizant NSA of the intent to accomplish the alteration. Indicate the purpose of the shipcheck, the number of people expected to participate and the number of days that access will be required. Indicate any required access to secure areas and any special requirements (securing transmitting equipment while shipchecking masts, etc.). The ship, the cognizant NSA and the appropriate squadron or group shall be provided information copies of the request. For shipchecks that are planned to be conducted during a scheduled CNO availability, the AIT shall provide clearance information to the cognizant Ship/NSA a minimum of 5 working days prior to arrival or as established by TYCOM policy.. If the shipcheck is to be conducted outside of a scheduled availability, the AIT shall provide visit clearance information to the cognizant Ship/NSA a minimum of 5 working days prior to arrival or as established by TYCOM policy..

3.1.1. Security clearances. After the TYCOM/NSA has provided the access date(s) for the shipcheck, preferably at least 30 days prior to arrival, the AIT will provide security clearance information to the ship, the TYCOM, the NSA, and appropriate Naval activities. Security clearance information is required a minimum of 5 working days prior to arrival or as established by TYCOM policy.

3.1.2. Check-in. The AIT will check in with the appropriate NSA, to effect security verification, shipcheck schedule verification, and badge issuance prior to proceeding to the shipcheck ship.

3.2. Arrival. Arrival at the ship should be arranged in advance with the cognizant NSA. Generally, arrival will be no earlier than 0830 and no later than 1530 unless previously arranged. Arrival between 1200 and 1300 should also be avoided.

3.2.1. Personnel identification. All required personnel identification should be available upon arrival at the site. Personnel identification shall be clearly visible, worn above the waist at all times when onboard ship and when transiting an industrial area.

3.2.2. Boarding the ship. Depending on the location of the ship at the site, access to the ship may be directly from the pier or via another ship. Personnel identification will generally be noted and recorded at the entrance to the pier or the industrial area and may again be checked when passing through other ships and again will be checked and recorded upon arrival on the ship to be shipchecked. Upon arrival at the ship to be shipchecked, ask for the established ship's point-of-contact or the Command Duty Officer. If neither is available, ask for the Operations Officer or the Work Center Supervisor of the area primarily involved in the shipcheck. State the purpose of the visit and provide a short in brief.

NO MEMBER OF THE TEAM SHALL LEAVE THE QUARTERDECK OR SHIP ENTRY AREA WITHOUT AN ESCORT OR UNTIL PERMISSION TO DO SO IS RECEIVED.

3.3. In Brief. Conduct an in-brief to explain the purpose of the shipcheck, the systems and spaces to be shipchecked and the procedures to be used as follows:

a. Provide a list of all personnel involved in the shipcheck and indicate that member(s) is(are) designated as point(s) of contact for the shipcheck team.

b. Outline the general procedures and approximate schedule for use during the shipcheck.

c. If a camera is intended to be used as part of the shipcheck, request permission to photograph and/or video tape the shipcheck area(s).

d. If it is anticipated that it will be necessary to scrape paint from cable tags or equipment label plates to determine

tag/plate information, especially on weatherdeck cables and equipment, request permission to do so and indicate that a list of the locations where this was done will be provided to the ship at the end of the shipcheck.

e. If normally unmanned or restricted areas of the ship are to be shipchecked, request permission to access these areas during prearranged periods on a not-to-interfere basis.

f. If transmitting systems such as communications or radar systems need to be inhibited or secured to gain safe access to masts, antennas or topside equipment as part of the shipcheck, or if power or other ship services must be secured to a specific equipment to gain safe access to the interior or back of that equipment, request permission for ship's force personnel to inhibit or secure the required equipment during a prearranged period of the shipcheck. Ensure that proper tag-out procedures are followed by the members of the ship's force.

MEMBERS OF THE SHIPCHECK TEAM SHALL NOT INHIBIT OR SECURE SHIP EQUIPMENT. ENSURE THAT EQUIPMENT HAS BEEN SECURED OR INHIBITED AND THAT PROPER TAG-OUT PROCEDURES HAVE BEEN OBSERVED PRIOR TO GOING ALOFT OR GOING INTO OR BEHIND EQUIPMENT. ENSURE THAT SHIP'S FORCE IS NOTIFIED WHEN A PERSON IS GOING ALOFT OR IS ENTERING OR GOING BEHIND DANGEROUS EQUIPMENT AND WHEN THAT PORTION OF THE SHIPCHECK IS COMPLETED SO CIRCUITS MAY BE RESTORED TO NORMAL OPERATION.

3.4. Shipcheck. Record the name and hull number of the ship being shipchecked and the date on each sheet of each drawing or sketch and all notes that are used or developed during the shipcheck as well as the date(s) of the shipcheck.

3.4.1. Recording physical configurations. Whenever possible, mark-up paper copies of the existing general arrangement drawing(s) of the space(s) to be impacted by the alteration. This will provide a record of the actual configuration of areas where equipment is to be removed or where new equipment is to be installed at the time of the shipcheck. If use of a camera is approved, photograph and/or video tape all critical locations, from more than one vantage point, and all areas that may have special design or installation problems. Place one or more six or eight-foot folding rules with enhanced markings in the areas to be photographed and/or video taped to provide an indication of scale and record critical measurements. For photographs, record the details of each photograph on the back of the photograph (ship identification, space identification and frame number, identification of the view [looking to port-forward from the centerline, etc.], and the subject of the photograph [back of

rack no. 3], etc.) When using a video camera to record shipcheck information, record the data in a film log noting the tape number, ship identification, sequence of recorded data [space identification and frame number, identification of the view {looking to port-forward from the centerline, etc.}, and the subject of the view {back of rack no. 3}, etc.) Information that may be needed to develop detail installation design includes:

a. Location of all compartments, spaces and areas in the ship that may be impacted by accomplishment of the alteration. This includes the name, compartment number and level of each space as well as all adjacent spaces (including above and below).

b. Within each space:

(1) Overall dimensions of the space.

(2) Measured distance between ship centerline and a specific location in the space (generally the bulkhead nearest the centerline).

(3) Frame member information including frame numbers in the areas of interest, type, construction, and measured separation between adjacent frames.

(4) Details of bulkhead and partition construction, including type, material and contour. Determine and note if bulkheads are part of watertight, airtight, fumetight, light tight, fire zone, air conditioning, Collective Protection System (CPS) boundary, and/or TEMPEST physical or electrical perimeter boundaries.

(5) Details of bulkhead and partition support members including type, material, size and spacing.

(6) Location and measured details of all structural interferences within the space.

(7) Details of overhead construction (including main support beams), including type, material, contour and measured distance above the deck at the corners of the space and at other locations within the space. Determine and note if the overhead is part of watertight, airtight, fumetight, light tight, fire zone, air conditioning, CPS boundary, and/or TEMPEST physical or electrical perimeter boundaries.

(8) Details of deck construction (including support beams), including type, material and contour. Determine and note if deck is part of watertight, airtight, fumetight,

light tight, fire zone, air conditioning, CPS boundary, and/or TEMPEST physical or electrical perimeter boundaries.

(9) Location and details of all doors, hatches, and scuttles including type, material, size and swing. Determine and note if doors and hatches are part of watertight, airtight, fumetight, light tight, fire zone, air conditioning, CPS boundary, and/or TEMPEST physical or electrical perimeter boundaries.

(10) Location and details of all stanchions including type and size.

(11) Location and details of all pipe runs including pipe size, service, distances from overhead at various locations, distance from nearest bulkhead at various locations, and penetration locations.

(12) Location and details of all waveguide runs including waveguide type/dimensions, service (radar, EW, etc.), distances from overhead at various locations, distance from nearest bulkhead at various locations, and penetration locations.

(13) Location and details of all vent duct runs including duct type/dimensions, service, distances from overhead at various locations, distance from nearest bulkhead at various locations and penetration locations.

(14) Location and details of all cableways including type, construction, routing, distances from overhead at various locations, distance from nearest bulkhead at various locations, available space, and penetration locations (stuffing tubes, riser boxes and bulkhead/deck coamings).

(15) Locations and measured details of all fabricated equipment foundations (measurements referenced to centerline/-bulkhead and height above the deck). Indicate equipment mounted on foundation.

(16) Locations, details and identification of all power, lighting, and Interior Communications (IC) distribution panels and switchboards, including type (symbol number), panel or switchboard number, service, distribution data, distance of the bottom of the enclosure to the deck, and distance from an outside edge of the enclosure to the nearest bulkhead.

(17) Locations, details and identification of all power, lighting, and IC fixtures (including connection boxes

and power outlets) that are not rack mounted, including type (symbol number), service, system identification data, distance of the bottom of the fixture to the deck (or overhead for overhead mounted equipment), and distance from the outside edge of the fixture to the nearest bulkhead.

(18) Identification and measured location of all other permanent equipment including:

(a) Racks and all equipment mounted in the racks. Include space between back of rack and bulkhead (or nearest structure) and space between front of rack and nearest rack, equipment or structure if less than five feet. Also note any pull-out, swing-out, or special access clearances that must be maintained.

(b) Shelf mounted equipment.

(c) Bulkhead, deck and overhead mounted equipment.

(d) Desks and tables including type, size, and fabrication.

(e) Fiddle boards including type, size, and fabrication.

(f) Plotting tables including type, size, and fabrication.

(g) Status or display panels including type, size, and fabrication.

(h) Workbenches including type, size, and fabrication.

(i) Storage containers (safes, lockers, cabinets, book shelves, bins, etc.) including type, size, and fabrication.

(j) Chairs, stools and benches including type, size, and fabrication.

(k) Administrative support equipment (copiers, shredders, sorting bins/trays, etc.) including type, size, and fabrication.

Note specifically the model (R-2368A/URR, etc.) and variant (AN/WSC-3(V)3, etc.) of the equipment, as applicable.

(19) Identification and measured location of all other permanent equipment which may require removal as interferences during accomplishment of the alteration. Systems and equipment required to be permanently modified or relocated to accommodate the alteration are not to be considered interferences but part of the design of the alteration.

c. Within adjacent spaces (including above and below), the measured locations of cable, pipe, waveguide, and vent duct penetrations that may be impacted by the alteration. Determine possible access problems and special requirements such as fire watches, equipment protection, interference removal, etc., that may be needed in these spaces when the alteration is accomplished.

d. Where cables will be removed or installed in cableways outside of the primary areas impacted by the alteration, these cableways shall also be shipchecked. For cableways that will have existing cable(s) permanently removed, the required information includes measured cableway routing, general cableway construction, penetrations that need to be plugged/filled, and general accessibility. For cableways that will have new cables installed, the required information includes measured routing of the cableway, general construction, existing spare capacity, spare penetrations that can be reused or measurements of locations where new penetrations can be installed, and locations where existing cableway hangers need to be modified or replaced or where new hangers will be required.

e. Where modifications to ship's weatherdeck structure are required or the arrangement of weatherdeck equipment is impacted by the accomplishment of an alteration. Required information may include:

(1) Detailed measurements to all antennas, damage control equipment, and replenishment stations within 30 feet of the impacted structure or equipment will be required. Record the identification of all such equipment/stations that fall within this radius.

(2) Detailed measurements to all CPS and Countermeasure Washdown System (CMWDS) components and boundaries within 30 feet of the impacted structure or equipment will be required. Record the identification of all such components that fall within this radius.

(3) Material composition of ship's structure (steel, aluminum, etc.).

(4) Types, sizes, and locations of structural beams supporting the deck and structure in the vicinity of proposed new structure or equipment location(s). Determine interior structure and equipment that may be immediately inside the ship from the proposed location(s).

(5) Possible location(s) for required cable penetration(s) for new or relocated equipment. Determine possible interior installation/access problems associated with new penetrations.

(6) EMC and EMP protection measures that may be required.

(7) Measured cable routing through interior and exterior cableways for all cables from new or relocated equipment to the primary termination (power or control, etc.). Determine locations where conduit, penetrations, cable protection, etc., will be required to meet all physical protection, EMI, RFI, EMC, EMP and TEMPEST requirements. Determine what modifications to existing cableways will be required. Where the most direct cable run does not appear to be practicable for an AIT installation or where portions of the proposed cable run could not be visually observed as part of the shipcheck and the actual condition of the existing cableway is unknown, identify possible alternate cable runs with the above information.

(8) Photographs and/or video tapes of the proposed new or modified structure or equipment location(s), all surrounding antennas, equipment and structure, and the entire proposed cable run(s).

f. Where antennas are to be installed or relocated as part of the alteration, detailed measurements must be made not only for the new antenna location but also for the routing of the antenna cables. Required information may include:

(1) Identification of all antennas (type, function [communications, radar/IFF, EW, CIWS, special function, etc.] and antenna identification number) and all permanent weatherdeck equipment and ship's structure within 30 feet of the proposed new antenna location.

(2) Measured distances from new antenna location to existing antennas, permanent weatherdeck equipment, and ship's structure within 30 feet of the proposed new antenna location.

(3) Material composition of ship's structure (steel, aluminum, etc.)

(4) Type, size, and locations of structural beams supporting the deck and structure in the vicinity of the proposed new antenna location. Determine interior structure and equipment that may be immediately inside the ship from the proposed location.

(5) Possible location(s) for required cable penetration(s). Determine possible interior installation/access problems associated with new penetrations.

(6) Measured cable routing through interior and exterior cableways for all antenna cables from the antenna to the primary termination (receiver, transmitter, coupler, RF distribution panel, etc.). Determine locations where conduit, penetrations, cable protection, etc., will be required to meet all physical protection, EMI, RFI, EMP, EMC and TEMPEST requirements. Determine what modifications to existing cableways will be required. Where the most direct cable run does not appear to be practicable for an AIT installation, or where portions of the proposed cable run could not be visually observed as part of the shipcheck and the actual condition of the existing cableway is unknown, identify possible alternate cable runs with the above information.

(7) Photographs and/or video tapes of the proposed new antenna location(s), all surrounding antennas, equipment and structure, and the entire proposed RF and control cable run(s). Take photographs and/or video tapes of the proposed new antenna location from the pier area or from another ship (from a distance) to clarify the relationship of the proposed antenna location(s) to the rest of the ship.

3.4.2. Determining configurations of electrical/electronic systems. Whenever possible, mark-up paper copies of the existing system diagrammatic drawing(s) (block, isometric or cabling deck plan) of the individual systems to be impacted by an alteration. This will provide a record of the actual configuration of those systems at the time of the shipcheck. It is important to determine and record all equipment, components, and cabling to be impacted by the alteration. Information that may be required to develop detailed design includes:

a. All equipment that could be removed or require relocation as a result of the accomplishment of the alteration.

Note specifically the model (CU-2279A/U, etc.) and variant (AN/WSC-3(V)3, etc.) of the equipment, as applicable.

b. All components (panels, connection boxes, transition devices, etc.) that could be impacted. Identify transformers planned for removal or relocation that could contain PCBs and therefore require special handling and disposal as hazardous material.

c. All cabling and cabling components that are part of the system that could be impacted. These include:

(1) All cabling, identified by circuit identification number and cable type. For cables to be removed or relocated identify cable insulating material (older cables may contain asbestos or other hazardous material and will require special handling and disposal as hazardous material).

(2) All connectors by type and connection to equipment or components (J1, etc.).

(3) All in-line devices (tees, dividers, combiners, transition fittings, etc.) by type/nomenclature.

(4) All impacted (existing or required new) cable penetrations (equipment, bulkhead, or deck stuffing tubes, strain relief, etc.) by type, size, material, and construction (kickpipes, gang or multiple penetrator, etc.) For existing penetrations and tubes, record penetration hole number/location identification number if assigned. Record also any existing spare penetrations that could be used for new cabling. Indicate locations where new penetrations will be required.

(5) If an isometric or deck cabling diagram is to be prepared for the ripout diagram and/or the alteration cabling diagram, note also the general routing of the cabling through the cableways (including special cable routing requirements - physical protection, major obstructions, ship expansion joints, EMI/EMP/TEMPEST protection, etc.), and the general location of all penetrations and stuffing tubes.

d. All existing waveguide and waveguide components (bends, transitions, etc.) that are to be impacted by the alteration and all special design considerations while will need to be addressed as part of the alteration design (major interferences that will need to be relocated, modified or routed around when new

waveguide is installed, maintenance access plate locations, locations of new bends or fittings, etc.).

3.4.3. Recording configurations of mechanical systems. Whenever possible, mark-up paper copies of the existing system diagrammatic drawing(s) of the individual mechanical systems to be impacted by an alteration. This will provide a record of the actual configuration of those systems at the time of the shipcheck. It is important to determine and record all equipment, components, and piping to be impacted by the alteration. Information that may be required to develop detail design includes:

a. All equipment that could be removed or relocated as a result of the accomplishment of an alteration. Note specifically the model and or type identification of the equipment, as applicable.

b. All components (indicator/control panels, sensors, limit switches, etc.) that are part of the system that could be impacted.

c. All piping and piping components that are part of the system that could be impacted. This includes:

(1) All piping, identified by system identification, type, size and length.

(2) All valves, identified by system identification, type, size and application.

(3) All fittings (elbows, tees, transition fittings, check valves, filters, hoses, etc.) by type and size.

(4) All piping penetrations by type and size. Record penetration number/location identification number if assigned. Record also any spare penetrations that could be used for new piping.

(5) All piping insulation which must be removed, relocated or replaced, even as interferences (older insulation may contain asbestos or other hazardous material and will require special handling and disposal as hazardous material).

d. All bulkhead or deck insulation which must be removed, even to gain access to interference items (older insulation may contain asbestos or other hazardous material and will require special handling and disposal as hazardous material).

3.5. Shipcheck completion. Upon completion of the shipcheck, collect all materials used for the shipcheck and prepare to depart the ship. Ensure that all equipment and component access panels that were opened or disturbed are restored to their proper position. Ensure that all materials and portable equipments where were temporarily removed to gain access to items to be shipchecked are restored to their original locations and are stowed to the satisfaction of the crew. Ensure that all shipcheck-generated trash is picked up and properly disposed of.

3.6. Departure. When departing the ship at the completion of the shipcheck, notify the ship's point-of-contact or other assigned member of the crew that the shipcheck has been completed and offer (and be prepared) to provide an out-briefing on the information gathered/determined as part of the shipcheck. Allow a review of all photographs and/or videotapes for possible classification prior to departure from the ship. When departing an industrial activity, inform the NSA of the departure. All special badges, passes, dosimeters, etc, will be turned-in, as required, in accordance with local requirements. Prior to final departure from the area, check out with the cognizant NSA.

APPENDIX F

SHIP'S FORCE IN-BRIEF

SHIP'S FORCE IN-BRIEF

Purpose. The purpose of a Ship's Force in-brief is to provide an overview and purpose of the alteration to be accomplished, outline work to be performed, review the schedule of accomplishment and the impact on the ship, confirm arrangements for requested/required services, establish responsibilities and points of contact, review planned ship's evolutions and review ILS products and training to be provided.

1. Alteration Overview. The overview provides a description of the alteration purpose and the expected improvements provided, areas of the ship impacted by the alteration and additional areas impacted by the accomplishment of the alteration and the impact on ship's services.

2. Work to be accomplished.

a. Review of installation drawings.

(1) Arrangement drawing(s) indicating equipment to be removed and locations of new, modified and relocated equipment.

(2) System drawing(s) indicating system interconnections and interfaces with ship system interfaces including power and ventilation.

(3) Cable and/or pipe runs.

b. Review of equipment and materials to be used.

(1) Review of equipment and material to be installed.

(2) Review of equipment and material to be removed

(3) Review of hazardous materials to used or removed and handling and disposal procedures.

c. Review of ship's systems impacted during alteration accomplishment and duration of impact.

d. Review of areas that may have restricted access during alteration accomplishment.

(1) Areas where welding is to be accomplished.

(2) Areas where hazardous materials are to be used or handled.

e. Review of applicable process control procedures to be used for fire prevention, hot work, sight and hearing protection, protection of pipes, cables, and equipment during shipwork, system or equipment deactivation/reactivation, material storage at the work site, storage, use and disposal of hazardous materials (including excess and partially used hazardous material and hazardous material removed as part of the accomplishment of the alteration), material for staging and screening, temporary covers and shelters, uncrating/unpacking of equipment and workmanship.

f. Review of personnel qualification/certifications for work requiring specific qualifications.

Schedule of events. A detailed review of schedule-of-work and test plan and/or System Operational Verification Testing (SOVT) agenda of all functional items shall be provided during the briefing. Key event checkpoints (e.g. piping flush, hydrostatic testing, cableway and compartment closeout, etc.) and system operational testing of all functional items will be provided for ship witnessing. The material deliveries, required compartment accesses, security requirements, and shift schedules will also be discussed at this time. The schedule information shall include projected start and finish dates, planned shift start time(s), planned testing periods, planned training dates and planned ILS turnover.

Planned ship's evolutions. Any special restrictions due to ship's evolutions during the availability (weapon loading, ship's receiver/transmitter testing, emergent requirements, other alterations being accomplished, etc.) which could impact or be impacted by work being performed by the AIT will also be discussed at this time. It will be the responsibility of the AIT to perform required shipwork around these restrictions. If restrictions exist which can not be accommodated by the AIT without jeopardizing scheduled completion date of the alteration or the scheduled departure date of the ship, the AIT will make arrangements with the cognizant NSA for accomplishment of the alteration during a subsequent availability and withdraw from the ship.

Confirmation of services. AIT arrangements for crane and/or welding services, special test requirements, fire watches, etc., will also be confirmed at this time. For alterations being accomplished during CNO availability, arrangements and associated funding for services included in the contract (if the alteration is to be accomplished at a private activity) (crane services,

welding services, special test requirements, fire watches, NSA disposal of turned-in equipment/material, etc.) will also be confirmed at this time.

Points-of-contact. The AIT On-site Installation Coordinator shall request the ship to provide the AIT with a list of all points-of-contact for accomplishment of the alteration(s), including those technical personnel assigned to work with the AIT and witness testing, the names of those people authorized to sign-off the Alteration Completion Report and the names of personnel authorized to accept delivery of computer tapes and ILS items. For alterations being accomplished during CNO availability, the NSA representatives, Planning Yard On-Site Representatives (Program Representative and CDM) and the lead ship availability manager from the industrial activity will also be identified. For alterations being accomplished during a CNO availability, the AIT On-site Installation Coordinator will also identify which AIT member(s) will attend daily progress meetings.

Responsibilities. The AIT On-site Installation Coordinator will be identified as being responsible for the conduct of the AIT and the person to be contacted in regard to work deficiencies, scheduling problems or problems with AIT members. The AIT On-site Installation Coordinator shall be responsible for being accessible to ship's force throughout the period(s) the AIT is on board the ship for resolution of identified deficiencies or problems associated with accomplishment of the assigned alteration(s). When work is being accomplished during a CNO availability, the AIT On-site Installation Coordinator shall also be accessible to the NSA and the lead ship availability manager at all times during period(s) the AIT is on board the ship. The AIT On-site Installation Coordinator shall be responsible for reporting any changes in schedule and providing notification to the ship, and the NSA of upcoming key event checkpoints and testing evolutions. Additionally, the AIT On-site Installation Coordinator(s) shall be identified. If multiple-shift work is to be accomplished, the Coordinator for each shift shall be identified.

ILS and training to be provided. The AIT will review all ILS products to be provided as well as all training to be provided at the time of installation. All applicable ILS elements listed in the ILS portion of the Alteration Completion Report shall be addressed.

TECHNICAL SPECIFICATION

TITLE: SHIP ALTERATION RECORD (SAR) PREPARATION

NO.: TS9090-500C

DATE: JUNE 2002

SUPERSEDES: TS9090-500B, dated MAY 89



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SHIP ALTERATION RECORD PREPARATION

1. SCOPE. This specification provides criteria for the uniform development, processing and maintenance of a Ship Alteration Record.

1.1 GENERAL. The SAR is the official record defining the approved changes to be made to a ship. The SAR is based upon the Justification/Cost Form (JCF) providing greater detail, a more complete Alteration Material List (AML), Integrated Logistic Support (ILS) documentation impacts and equipment removals. The SAR is composed of the data defined in sections 3.4.1 through 3.4.23 below. This record requires approval by the organization designated as the SAR Approver in the JCF (See Tech Spec 9090-210A section 2.38). In accordance with the FMP milestones, the SAR shall be completed no later than A-12 for the availability of the first intended install and the SAR Approver shall approve the SAR no later than A-11. The SAR shall be completed in Microsoft Word © using the Template found on the FMP Website (www.FMP.NAVY.MIL).

1.2 APPLICABILITY. This specification is applicable to surface ships, surface craft, and submarine SARs and shall be utilized by all Planning Yards/Design Agents (hereafter referred to as "Planning Yards") and NAVSEA/SPAWAR/NAVAIR etc. personnel for preparing, processing and maintaining Ship Alteration Data except as noted herein (see Section 1.3).

1.3 EXCEPTIONS. This specification shall not be used for preparation of the following:

- a. SARs under the cognizance of the Deputy Commander of Nuclear Propulsion, NAVSEA 08.
- b. Strategic Systems Program Alterations (SPALTS) issued for the Director, Strategic System Programs (DIRSSP).
- c. Aircraft launch and recovery equipment changes under the cognizance of the Commander, Naval Air Systems Command.
- d. Changes to the internals of equipments that do not impact the equipment interface with the ship. These include Machinery Alterations (MACHALTs), Ordnance Alterations (ORDALTs), Field Changes, Equipment Engineering Changes (ECs), Technical Directives (TDs), and Engineering Change Proposals (ECPs).
- e. Alterations affecting configuration of hardware, software, and support equipment of the TRIDENT System under the cognizance of PMS 392. The TRIDENT System comprises OHIO Class Submarines; dedicated maintenance, training and logistic facilities; and replacement equipment pools.

2. APPLICABLE DOCUMENTS

2.1 ISSUE OF DOCUMENT. The following documents, of the issue in effect on the date of the tasking documentation, form a part of this specification to the extent specified herein.

PUBLICATIONS

MILITARY

MIL-STD-1680 - Installation Criteria for Shipboard Secure Electrical Processing Systems

DEPARTMENT OF DEFENSE

H4/H8 - Commercial and Government Entity (CAGE) Cataloging Handbook.

CHIEF OF NAVAL OPERATIONS

OPNAVINST 4790.4 - Ship's Maintenance and Material Management (3-M) Manual

OPNAVINST 5510.1 - Department of the Navy, Information Security Program

NAVAL SEA SYSTEMS COMMAND

S0924-062-0010 - SUBSAFE Manual

S9040-AA-IDX-010/SWBS 5D - Expanded Ship Work Breakdown Structure (ESWBS) for all Ships and Ship/Combat Systems

NAVSEAINST 5000.39 - Acquisition and Management of Integrated Logistic Support for Ships, Systems, and Equipment

NAVSEAINST 5510.1 – Command Headquarters Security Program Regulation

NAVSEAINST 9210.14 – Changes to Submarine Tenders and Destroyer Tenders with Nuclear Support Facilities

NAVSEAINST C9210.4 - Changes, Repairs and Maintenance to Nuclear Powered Ships

NAVSEAINST C5511.32 - Naval Nuclear Propulsion Information; Safeguarding of

NAVSEAINST 5720.3 - Review and Release of Unclassified Technical Information and Assignment and Distribution Statements for "For Official Use Only" Markings to Technical Documents

TECHNICAL SPECIFICATIONS

NAVSEA TS-9090-210A – Justification/Cost Form (JCF)

3. REQUIREMENTS

3.1 GENERAL. The Ship Alteration Record (SAR) is a collection of elements required to further define an alteration from the data used to approve the concept in the JCF (See Tech Spec 9090-210A).

3.1.1 RESTRICTIVE DATA. Individual SARs shall not reference the following:

- a. Planning Yard or other local procedures, standards or specifications.
- b. Any specific availability or overhaul.
- c. The shipyard assignment for any ship.
- d. Any miscellaneous information relating to operations or procedures peculiar to a specific shipyard or activity.
- e. Material specifications based on the material's availability in the Planning Yard's shipyard stock. Material shall be selected on the basis of its general availability, according to the best information held by the Planning Yard, to all installing activities.
- f. Specifications of commercial proprietary material unless there is no generic

equivalent. If proprietary material is required, complete identification of the product shall be provided on the Alteration Material List (AML).

g. Proprietary vendor drawings unless required as part of product identification.

h. Material part numbers or stock numbers which are peculiar to the Planning Yards stock system or other Government agencies stock system other than the National Stock System.

3.2 RESPONSIBILITIES. Any organization may prepare Ship Alteration Records as determined, tasked, and funded by the cognizant Ship Program Manager (SPM). The Data elements listed in Section 3.3 and 3.4 below list the organization intended to input the required data. The description of these organizations is listed below.

3.2.1 SAR Preparer. The SAR Preparer is the organization designated by the SPM in the JCF (See Tech Spec 9090-210A section 2.37) to develop the SAR document. The SAR Preparer will normally be the Planning Yard or the PARM.

3.2.2 SAR Approver. The SAR Approver is the organization designated by the SPM in the JCF (See Tech Spec 9090-210A section 2.38) to approve the SAR.

3.2.3 Participating Managers (PARMs). The PARM is responsible to program, budget and procure all Headquarters Centrally Provided Material. In addition they are responsible to maintain the Navy Data Environment-Navy Modernization (NDE-NM) Material Dictionary and coordinate with the SPM to insure the material requirements match the installation requirements.

3.2.4 PLANNING YARDS (PY). The Planning Yard for each ship class, as designated by NAVSEA SL720-AA-MAN-010/FMP, is the Engineering Design Agent for assigned specific classes of ships. Responsibilities assigned to the Planning Yard include accuracy and completeness of the SAR. Planning Yards may be tasked to approve the SARs as tasked and funded by the SPM.

3.2.5 SHIP PROGRAM MANAGER (SPM). SPMs are responsible for final NAVSEA approval of a SAR unless the approval is delegated. The SPM is also responsible for obtaining appropriate concurrence from any other activity prior to their approval.

3.3 SAR PREPARATION REQUIREMENTS

3.3.1 SECURITY CLASSIFICATION AND SPECIAL HANDLING. Security classifications and special handling marking of SARs shall be limited to "UNCLASSIFIED", "FOR OFFICIAL USE ONLY" or "NOFORN". This will be determined by the SAR preparer and if the classification is other than UNCLASSIFIED the classification will be placed in the upper right and lower left corner of all copies of the SAR.

3.4 SAR CONTENT. The SAR content shall be as specified herein. Figure 3 lists all of the fields and the activity that is designated to provide the information in each field.

3.4.1 SHIPALT IDENTIFICATION. This field is for the approved SHIPALT Identification Number. The SHIPALT Number will include the ship class, the number and the title (e.g. K, D, F). This field will be copied from the approved JCF (See Tech Spec 9090-210A Section 2.1) by the SAR Preparer.

3.4.2 REV. This field is used to show the revision of the SAR. The initial issue of the SAR shall show 00 in the revision field. Subsequent revisions shall be 01, 02 etc.

3.4.3 BRIEF. This field is a brief description of the SHIPALT. This field will be copied from the JCF (See Tech Spec 9090-210A Section 2.3) by the SAR Preparer unless otherwise directed by the SPM (Note: changes in the shipalt Brief after JCF development may make Battle Group Interoperability confirmation more difficult). This field shall be no more than 30 Characters in length in order to comply with the FMPMIS (NDE-NM) Database requirements.

3.4.4 NAVSEA/PEO LEAD TECH CODE CONCURRENCE. This field is to be filled in by the SAR Approver after obtaining the required concurrences or NA will be entered if this approval is not required.

3.4.5 ENGINEERING AGENT CONCURRENCE. This field is to be filled in by the SAR Approver after obtaining the appropriate engineering agent concurrence or NA will be entered if this approval is not required.

3.4.6 OTHER CONCURRENCE. This field is provided to enter the Name and Phone number of any other organization and POC whose concurrence is required. The field is to be filled in by the SAR Approver after obtaining the required concurrence. The activity (SPAWAR, NAVAIR, NAVSEA 08) and the POCs name with the (S) to indicate the signature is on file is required for this field. This field has two columns; the first is for the Activity of the TPOC; the second is for the Name and Phone number of the TPOC.

3.4.7 LEAD LCM (LOGISTICS). This field is to be used for entering the logistics Life-Cycle Manager for the system or equipment being installed. This field will consist of two parts: the first is for the activity of the Lead LCM (Logistics); the second is for the Name and Phone number of the POC to be entered. This field shall be copied from the JCF (See Tech Spec 9090-210A Section 2.40) by the SAR Preparer.

3.4.8 SAR APPROVER. The SAR Approver as designated in Tech Spec 9090-210A Section 2.38 is the approving authority for the SAR. This field will consist of three parts; the first is for the Activity of the SAR Approver; the second is for the Name and Phone number of the TPOC ; the third is the date the SAR was approved.

3.4.9 PLANNING YARD TECHNICAL POINT OF CONTACT. The Planning Yard TPOC is the name of the person at the planning Yard with intimate knowledge of the alteration. This field is to be completed by the Planning Yard.

3.4.10 ESWBS (EXPANDED SHIP WORK BREAKDOWN STRUCTURE) NUMBER. The ESWBS fields shall indicate the ESWBS number selected from NAVSEA

S9040-AA-IDX-010/SWBS 5D, which is most closely associated with the system, component or structure being impacted by the alteration. This field is to be completed by the SAR Preparer.

3.4.11 3-M NOUN NAME. The 3-M Noun Name field shall indicate the 3-M equipment/system noun name. The equipment/system nomenclature/description shall be the same as that identified by the ESWBS number in NAVSEA S9040-AA-IDX-010/SWBS 5D. In cases where the equipment being installed or modified has a specific nomenclature (AN/SSQ-80, R-1051(F)/URR, etc.), the nomenclature shall be utilized as the 3-M Noun Name. The 3-M Noun Name is utilized by the Type Commanders (TYCOMs) as a data element entry in the TYCOM Alteration Management System (TAMS)(Applicable to SUBLANT and SUBPAC ships only) and on OPNAV Form 4790/CK (Configuration Change Notification) as required by OPNAVINST 4790.4. This field is to be completed by the SAR Preparer.

3.4.12 EIC (EQUIPMENT IDENTIFICATION CODE). The EIC field shall indicate the Equipment Identification Code of the equipment or system being installed by the SHIPALT. The number should be selected from the EIC Master Index S9040-AC-IDX-010/SHIPS, the 3-M Reference CD, the EIC Master File tape from NAVSEALOGCEN or the NAVSEALOGCEN website. The EIC is a seven-digit alpha/numeric field that is left justified and zero filled. This field is to be completed by the SAR Preparer.

3.4.13 AIT CAPABLE. This field is an indication (Y/N) of whether or not accomplishment of this alteration is within the capability of an Alteration Installation Team (AIT). If this field is marked as Yes, then the mandays shown on the cost estimate sheet (see 3.4.37) should be the installation mandays required by the AIT. This field shall be copied from the JCF (See Tech Spec 9090-210A Section 2.17) by the SAR Preparer.

3.4.14 SAFETY ALT. This checkbox is an indication (Y/N) of whether or not the change or alteration is specifically intended to correct a pre-existing safety problem or provide a safety operating or living environment. If this box is checked the Category Code (Paragraph 3.4.18) must be a 1 or 2. This field shall be copied from the JCF (See Tech Spec 9090-210A Section 2.18) by the SAR Preparer.

3.4.15 SUBSAFE IMPACT. This field is an indication (Y/N) of whether or not accomplishment of the change or alteration impacts a SUBSAFE boundary. This field shall be copied from the JCF (See Tech Spec 9090-210A Section 2.11) by the SAR Preparer.

3.4.16 ILS AFFECTED. This field is an indication (Y/N) whether or not installation of this alteration will affect Integrated Logistics Support (ILS). This will include but not be limited to any update/changes to any existing Technical Manuals, new Technical Manuals, Supply Support (e.g., INCO's, MAMs, Onboard Spares, etc.), Maintenance Index Pages (MIPs), Maintenance Requirements Cards (MRCs), Technical Repair Standards (TRSs), Class Maintenance Plans (CMPs), Intermediate Repair Standards (IRSs), any changes or additions to any existing training plan, new training plan, special tools, alignment jigs, test equipment, any changes or additions to any existing SRD's or development of new SRD's for equipment installation and certification of this alteration. This field shall be copied from the JCF (See Tech Spec 9090-210A Section 2.19) by the SAR Preparer.

3.4.17 SHIPBOARD STOWAGE AFFECTED. This field is an indication (Y/N) whether or not installation of this alteration will require any use of shipboard Stowages. This field shall be copied from the JCF (See Tech Spec 9090-210A Section 2.20) by the SAR Preparer.

3.4.18 CATEGORY CODE. This field lists the NDE category code for the alteration as shown below. This field shall be copied from the JCF (See Tech Spec 9090-210A Section 2.29) by the SAR Preparer.

<u>CODE</u>	<u>DESCRIPTION</u>
0	PRIORITY LEVEL NOT ESTABLISHED
1	MANDATORY AND SAFETY
2	RELIABILITY AND MAINTAINABILITY (PRIMARY)
3	PRIMARY MISSION SYSTEM MODERNIZATION
4	RELIABILITY AND MAINTAINABILITY (SEC) MISSION AREA
5	SECONDARY MISSION AREA MODERNIZATION
6	MISSION SUPPORT

3.4.19 INDUSTRIAL STOWAGE AFFECTED. This field is an indication (Y/N) whether or not installation of this alteration will require any use of industrial Stowages. This field shall be copied from the JCF (See Tech Spec 9090-210A Section 2.21) by the SAR Preparer.

3.4.20 TOC. This field is used to list the estimated Total Ownership Costs (TOC) for the change or alteration. This cost should be expressed in manhours and can be either positive or negative. This field shall be copied from the JCF (See Tech Spec 9090-210A Section 2.35) by the SAR Preparer.

3.4.21 TMA/TMI. This field is used to indicate (Y/N) whether or not this change or alteration is a Top Management Attention (TMA) or Top Management Issue (TMI) item. This field shall be copied from the JCF (See Tech Spec 9090-210A Section 2.24) by the SAR Preparer.

3.4.22 DESCRIPTION. The Description field shall provide a brief description of the alteration to the extent necessary to begin detailed design. The description of the alteration shall indicate the spaces, systems and equipment impacted by the alteration and the extent of the impact. The description shall specifically address equipment to be added (Government or installing activity furnished) and/or deleted and the impact (increase or decrease) on power (steam generation, electrical generation and/or distribution systems), fluids (water, hydraulic, dry air, lubricating oil, fuel oil, etc.), compressed gasses (oxygen, nitrogen, etc.), firemain, ship's structure, interior communications circuits, habitability/accommodations, stowage, heating, ventilation and air conditioning. The description shall also specifically address, by space name and compartment number, any impact (increase or decrease) in weight and heat dissipation. Alterations impacting SUBSAFE systems or equipment as defined in NAVSEA 0924-062-0010 (SUBSAFE Manual) shall include in the description field a statement identifying the systems and

equipment as SUBSAFE. An explanation of how the SUBSAFE boundaries are impacted and how the SUBSAFE integrity will be maintained shall also be included in this field. Mandatory locations and interface requirements shall be supported by sketches and/or referenced documentation. This field is to be completed by the SAR Preparer.

The description shall be detailed enough to be used as a starting point for detailed design but need not be to the specific pipe/duct/cable level except in instances where this information is critical to the installation. Also, information as to equipment installation location should be detailed to an area of a compartment, not to a specific frame number or distance from the centerline, unless this level of detail is critical to the accomplishment of the SHIPALT. If required, a separate SHIPALT Guidance Document shall be referenced which provides a detailed description of the SHIPALT. In such cases, the referenced guidance document must be submitted to the SPM prior to the SAR approval.

For those ships indicated as scheduled to receive the intent of a SHIPALT during construction add the following to the description:

"NOTE: For those ships listed as applicable which have an asterisk (*) next to the hull number, the intent of this alteration has been or is planned to be accomplished during new construction as part of Headquarters Modification Request (HMR) (or Field Modification Request (FMR)). If the applicable HMR (or FMR) is verified to be completed in any of these ships, this SHIPALT is to be considered complete on the applicable ship and the hull number listed for record purposes only. If HMR (or FMR) cannot be verified as complete in any of these ships after construction, this SHIPALT can then be considered for accomplishment in these hulls.

3.4.23 APPLICABLE SHIPS. This field is a list of all of the ships in the ship class that the SAR is applicable to. This field is to be completed by the SAR Preparer.

3.4.24 REFERENCES. This field is a list of all of the documents referred to in the description (See Section 3.4.22). The documents shall be entered in the order of their occurrence in the description and designated with a numerical reference number. This field is to be completed by the SAR Preparer.

3.4.25 ESTIMATED WEIGHT AND MOMENT IMPACT (WT & MOM). The Weight and Moment Impact field shall provide an estimate of any weight and moment change caused by the SHIPALT (increase or decrease), including loads (ammunitions, provisions, stores, fuel oil, water, etc.). Weight shall be estimated to the nearest +/- 0.1 ton (the term "Negligible" shall not be used for the weight estimate); Vertical Center of Gravity (VCG) to the nearest foot, Longitudinal Center of Gravity (LCG) to the nearest foot forward or aft of the mid perpendicular of the ship, and the Transverse Center of Gravity (TCG) to the nearest foot port or starboard of the centerline. If the SHIPALT includes modification to a hull form or an appendage (bilge keel, sonar dome, etc.), a buoyancy impact of the weight of the displaced water volume shall also be estimated to the nearest +/- 0.1 ton. This field is to be completed by the SAR Preparer.

3.4.26 ALTERATION MATERIAL LIST (AML). This field shall be used for entering all logistically significant material required for the execution on the SHIPALT. This field is to be completed by the SAR Preparer.

3.4.27 QUALITY ASSURANCE (Q/A CERTIFICATION REQUIREMENTS). The Quality Assurance field shall identify any special quality assurance certification requirements, which must be used to assure successful accomplishment of the SHIPALT including requirements for technical documentation (technical manual verification/certification, etc.). Applicable testing and safety certification that is required shall be specifically addressed (e.g., requirement to adjust firing cams, conduct Structural Test Firings (STF), etc.). This field is to be completed by the SAR Preparer.

3.4.28 SSR (SHIP SELECTED RECORD DOCUMENTATION). The Ship Selected Records (SSR) field shall identify the types of Ships Selected Records (data and drawings) (TABS, DCB, CSTOM, SIB/SSM, SDI, CSAM, SSCB, SRD'S, COSAL, CSOSS, EOSS, SEPM) which are impacted by the accomplishment of this SHIPALT. This field is to be completed by the SAR Preparer.

3.4.29 ILS CERTIFICATION FORM (Y/N). This field indicates if the ILS Certification Form is required. This field is to be completed by the SAR Preparer.

3.4.30 SPECIAL DISPOSITION REQUIREMENTS FOR REMOVED MATERIAL. This field will contain a list of all removed material requiring special disposition and the disposition required. This field is to be completed by the SAR Preparer.

3.4.31 INSTALLATION SUPPORT AND TEST EQUIPMENT. This field will list all the Support and Test Equipment (S&TE) that is required to support the installation of the alteration (Jigs, Alignment, I/D level TE) (The S&TE required for ships force to trouble-shoot and maintain the equipment is listed in the ILS Cert). This field is to be completed by the SAR Preparer.

3.4.32 SHIPBOARD STOWAGE DETAILS. This field will list all general shipboard stowage requirements for the alteration. If there are any special requirements they should be listed in the Description (See Section 3.4.22). This data field is to be filled in by the SAR Preparer.

3.4.33 SPECIAL INDUSTRIAL STOWAGE REQUIREMENTS. This field will list all special stowage requirements at the industrial activity installing the alteration. This section should include but not be limited to requirements such as environmental or security stowage. This field is to be completed by the SAR Preparer.

3.4.34 PROOFING REQUIREMENTS. The purpose of proofing is to ascertain that the intended purpose of the alteration is satisfied and to identify any deficiencies so that immediate corrective action can be initiated for the first time installation to preclude a repeat of the same problems on subsequent installations. If Proofing is required then the SAR Approver must enter the activity assigned to do the proofing in this field.

3.4.35 REQUIRED PRIOR OR CONCURRENT ALTS. This data field is to be used by the JCF submitter to list any prior or concurrent alts required by this proposal. This section should include but not be limited to SHIPALTs (both approved and pending), MACHALTs, ORDALTs, Engineering Changes, Field Changes, SPALTs and Technical Directives. This field shall be copied from the JCF (See Tech Spec 9090-210A Section 2.8) by the SAR Preparer.

3.4.36 OTHER SYSTEMS INTERFACE. This field is for the JCF submitter to list any other interface to ships systems other than those covered in the Y/N check boxes above. This includes impacts such as Weapons storage (either temporary or permanent) or Fuel offload. This field shall be copied from the JCF (See Tech Spec 9090-210A Section 2.27) by the SAR Preparer.

3.4.37 SHIPALT COST ESTIMATE RECORD SHEET. Use this table to provide a per ship estimated cost for installation of the SHIPALT on the applicable hulls. Estimates should be broken down to segment pre-fabrication/installation/removal mandays and interference mandays for each of the production, service, and material cost categories shown in Figure 2. There is a field for explanation of the cost estimate if required and a field for entering the estimator's name and phone number. This field is to be completed by the Shipalt Preparer or other activity as designated by the SPM.

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[illegible]

FIGURE 1

SHIPALT COST ESTIMATE RECORD SHEET (3.4.37)

Class of Estimate _____	Pre-Fab/Install /Removal	Interferences
Production M/D's		
Structural	_____	_____
Mechanical	_____	_____
Piping	_____	_____
Electrical/Electronics	_____	_____
Paint/Instl/Etc.	_____	_____
Testing	_____	
Total M/D's	_____	_____
 Services M/D's	_____	
Total Production M/D's	_____	_____
 Material (Dollars)		
LLT Material	_____	_____
Remaining Material	_____	_____
 Total Material Cost	_____	_____
 DSA Costs (Mandays) _____		
Total SHIPALT Costs M/D's (Dollars) _____		

Explanation:

This estimate is based as a stand alone work item. As such, neither interferences from competing work items nor benefits from packaging with other items are considered. Changes in the scope of work required can significantly change the SHIPALT estimate.

Estimator _____ (name) _____ (phone)

FIGURE 2

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FIELD AUTHORITY TABLE

FIELD	TITLE	RESPONSIBILITY
3.4.1	SHIPALT IDENTIFICATION	SAR PREPARER
3.4.2	REV	SAR PREPARER
3.4.3	BRIEF	SAR PREPARER
3.4.4	NAVSEA/PEO LEAD TECH CODE CONCURRENCE	SAR APPROVER
3.4.5	ENGINEERING DIRECTORATE CONCURRENCE	SAR APPROVER
3.4.6	OTHER CONCURRENCES	SAR APPROVER
3.4.7	LEAD LCM (LOGISTICS)	SAR PREPARER
3.4.8	SAR APPROVER TPOC	SAR APPROVER
3.4.9	PLANNING YARD TPOC	PLANNING YARD
3.4.10	ESWBS	SAR PREPARER
3.4.11	3-M NOUN NAME	SAR PREPARER
3.4.12	EIC	SAR PREPARER
3.4.13	AIT CAPABLE	SAR PREPARER
3.4.14	SAFETY ALT	SAR PREPARER
3.4.15	SUBSAFE IMPACT	SAR PREPARER
3.4.16	ILS AFFECTED	SAR PREPARER
3.4.17	SHIPBOARD STOWAGE	SAR PREPARER
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3.4.19	INDUSTRIAL STOWAGE AFFECTED	SAR PREPARER
3.4.20	TOC	SAR PREPARER
3.4.21	TMA/TMI	SAR PREPARER
3.4.22	DESCRIPTION	SAR PREPARER
3.4.23	APPLICABLE SHIPS	SAR PREPARER
3.4.24	REFERENCES	SAR PREPARER
3.4.25	ESTIMATED WEIGHT AND MOMENT IMPACT	SAR PREPARER
3.4.26	ALTERATION MATERIAL LIST (AML)	SAR PREPARER
3.4.27	QUALITY ASSURANCE (Q/A/CERTIFICATION REQUIREMENTS)	SAR PREPARER
3.4.28	SSR	SAR PREPARER
3.4.29	ILS CERTIFICATION FORM	SAR PREPARER
3.4.30	SPECIAL DISPOSITION REQUIREMENTS FOR REMOVED MATERIAL	SAR PREPARER
3.4.31	INSTALLATION SUPPORT AND TEST EQUIPMENT	SAR PREPARER
3.4.32	SHIPBOARD STOWAGE DETAILS	SAR PREPARER
3.4.33	SPECIAL INDUSTRIAL STOWAGE REQUIREMENTS	SAR PREPARER
3.4.34	PROOFING REQUIREMENTS	SAR PREPARER
3.4.35	REQUIRED PRIOR OR CONCURRENT ALTS	SAR PREPARER
3.4.36	OTHER SYSTEMS INTERFACE	SAR PREPARER
3.4.37	SHIPALT COST ESTIMATE RECORD SHEET	SAR PREPARER

FIGURE 3

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TECHNICAL SPECIFICATION

TITLE: SHIP ALTERATION DRAWINGS PREPARATION

NO.: TS9090-600A

DATE: JUNE 2002

SUPERSEDES: TS9090-600, dated AUGUST 85



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Commander, Naval Sea Systems Command**

**Naval Sea Systems Command
1333 Issac Hull Avenue S.E.
Washington, D.C. 20376**

Ship Alteration Drawing Preparation

1. This specification is published to establish minimum requirements for preparation of Ship Alteration (SHIPALT) Drawings (SIDs). This specification should also be complied with, as practical, for other Alteration drawings.
2. Recommended corrections, additions, or deletions should be addressed to Commander, Puget Sound Naval Shipyard, 1400 Farragut Ave, Bremerton, WA 98314-5001, Attn: Code 270

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SHIP ALTERATION DRAWING PREPARATION

1. SCOPE

1.1 General. This specification provides minimum requirements for the uniform preparation of non-nuclear Ship Alteration (SHIPALT) Drawings (hereafter referred to as *drawings*) used for the accomplishment of all non-nuclear SHIPALTs except as noted herein (see 1.3).

1.2 Applicability. This specification is applicable to surface ship and submarine engineering drawings and associated lists and shall be utilized by all Hull Planning Yards/Design Agents (hereafter referred to as *Planning Yards*) for preparation of all working drawings prepared for accomplishment of SHIPALT work except as noted herein (see 1.3).

1.3 Exceptions. This specification shall not be utilized for preparation of the following:

- Drawings prepared for Nuclear Propulsion Plant SHIPALTs under the cognizance of the Deputy Commander for Nuclear Propulsion, NAVSEA 08.
- Drawings prepared for installation of Special Project Alterations (SPALTs) issued by the Director, Special Strategic Project Office, NAVMAT PM-1.
- Drawings concerning aircraft launch and recovery equipment that are under the cognizance of the Commander, Naval Air Systems Command.
- Ship's Selected Record Drawings (SRDs).

2. APPLICABLE DOCUMENTS

2.1 General. The following documents, of the issue in effect on the date of invitation for bids or request for proposals (for private Planning Yards) or on the date of the tasking documentation (for public Planning Yards), or as specified in the data of the tasking correspondence, form a part of this specification to the extent specified herein.

2.1.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks of the exact revision listed below form a part of this document to the extent specified herein.

SPECIFICATIONS

Federal

L-P-519
CCC-C-531

Plastic Sheet, Tracing, Glazed and Matte Finish
Cloth, Tracing

Military

MIL-DTL-31000

Technical Data Packages, General Specifications for

MIL-PRF-5480

Data, Engineering and Technical, Reproduction
Requirements for

MIL-D-23140

Drawings, Installation Control for
Shipboard Electronics Equipment**NAVSEA**

Technical Specification 9090-100

SHIPALT Technical Liaison Services, Waivers and
Deviations

Technical Specification 9090-500

Ship Alteration Record Preparation

STANDARDS**Military**

DOD-STD-2003-5

Electric Plant Installation Standard Methods for
Surface Ships and Submarines (Connectors)

MIL-STD-22

Welded Joint Design

MIL-STD-25

Ship Structural Symbols for Use on Ship Drawings

DOD-STD-100

Engineering Drawing Practices

MIL-STD-129

Marking for Shipment and Storage

MIL-STD-196

Joint Electronics Type Designation System

HANDBOOKS

MIL-HDBK-505

Definitions of Item Levels, Item Exchangeability,
Modules and Related Terms

2.1.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications of the exact revision level shown form a part of this document to the extent specified herein.

PUBLICATIONS**DEPARTMENT OF DEFENSE**

H4-1/H4-2 - Cataloging Handbook

CAGE Code for Manufacturers and
Government, Name to Code and Code to Name**NAVAL SEA SYSTEMS COMMAND**

0900-LP-001-7000

Fabrication and Inspection on Brazed Piping Systems

0902-018-2010

General Overhaul

0902-LP-041-2010

Specification for Deep Diving Submarine

0948-LP-045-7010

Standard Specifications for U.S. Navy Craft

Material Control-Standard

S9040-AA-IDX-010/SWBS5D	Ship Work Breakdown Structure
S9074-AQ-GIB-010/278	Requirements for Fabrication Welding and Inspection, and Casting Inspection and Repair for Machinery, Piping, and Pressure Vessels
S9AA0-AA-SPN-010/GEN-SPEC	General Specifications for Ships of the United States Navy [Last revision 1995 for internal NAVSEA use only]
S9AA0-AB-GOS-010	General Specifications for Overhaul of Surface Ships (GSO) Including the Aegis Supplement
S0005-AE-PRO-010/EDM	NAVSEA Engineering Drawing Life-Cycle Management Process Manual
SL720-AA-MAN-010	Fleet Modernization Program Management and Operations Manual
SECNAVINST 5510.30	Department of the Navy Personnel Security Program
SECNAVINST 5510.36	Department of the Navy (DON), Information Security Program (ISP)
NAVSEAINST 9085.2	Engineering Drawing Acquisition and Life-Cycle Management Policy and Responsibilities
NAVSEA Drawing No. 53711-803-5001049	Piping System Symbols and abbreviations

2.2 Other Publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on the date of the invitation for bids or request for proposal (for private Planning Yards) or the date of the tasking documentation (for public Planning Yards) shall apply.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI/AWS A2.4	Symbols for Welding and Nondestructive Testing
ANSI / ASME Y14.1	Drawing Sheet Size and Format
ANSI / ASME Y14.2	Line Conventions and Lettering
ANSI / ASME Y14.3	Multi and Sectional View Drawings
ANSI / ASME Y14.5	Dimensioning and Tolerancing
ANSI Y14.15	Electrical and Electronic Diagrams
ANSI Y14.15a	Interconnection Diagrams
ANSI Y14.17	Fluid Power Diagrams
ANSI / ASME Y32.2	Graphic Symbols for Electrical and Electronics Diagrams
ANSI / ASME Y32.10	Graphic Symbols for Fluid Power Diagrams
ANSI Y32.16	Reference Designations for Electrical and Electronics Parts and Equipment
ANSI Y32.2.4	Redesignation of Graphic Symbols for Heating, Ventilating and Air Conditioning

(Application for copies should be addressed to the American National Standard Institute, 1430 Broadway, New York, New York 10018.)

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME Y14.38

Abbreviations and Acronyms

ASME Y14.100

Engineering Drawing Practices

3. REQUIREMENTS

3.1 Precedence. In the event of conflict between the requirements of this specification and the documents referenced herein, the requirements of this specification shall apply except in the event of conflict between the requirement of this specification and the requirement of NAVSEA 0902-018-2010, NAVSEA 0902-LP-041-2010, NAVSEA S9AAO-AB-GOS-010, or NAVSEA S9AAO-AA-SPN-010/GEN-SPEC. In these cases, the requirements of those documents shall apply.

3.2 General.

3.2.1 SHIPALT Drawings. SHIPALT drawings are those drawings which are utilized by a shipyard or other activity (including Ship's Force) for the accomplishment of all non-nuclear SHIPALT work. These drawings also provide a record of ship configuration after SHIPALT accomplishment, are used by Ship's Force in maintenance and casualty control, are used by material support activities in determining support requirements, and are used by NAVSEA to maintain system and compartment configuration control. These drawings include, as required, system drawings and diagrams, arrangement drawings, structural drawings, manufacturing drawings, assembly and detail drawings, removal drawings, temporary access/egress drawings, cabling sheets and special drawings and shall meet the following general criteria:

- a. Drawings shall be prepared to meet the requirements of this specification.
- b. Drawings shall be as complete as practicable; i.e., drawings should not rely on references to other drawings or other sources of technical data to provide information which would be more easily utilized by the installing activity if presented on the drawing. When reference to other data sources (technical manuals, specifications, standards, drawings, etc.) is required, the drawings shall not reference restrictive data (3.2.4) that would not be available at all installing activities.
- c. Unless otherwise approved by NAVSEA, drawings shall contain complete ordering information for all required parts, material and equipment. Any Standards referenced for manufacturing must be readily available.
- d. SHIPALT engineering design shall be applied to drawings either as revisions to existing drawings (see 3.4.16 (a)) or by creation of new drawings. New drawings can be in the form of modification drawings (see 3.4.16 (b)), superseding drawings (see 3.4.16 (c)), or *stand-alone* drawings (drawings which do not change or supersede information shown on other drawings, usually providing a new design or capability to the ship). If SHIPALT design is applied to an existing drawing, the revisions which applies to the design shall clearly indicate the changes caused by the SHIPALT without loss of essential information which describes ships which have not completed the SHIPALT or are not applicable to the SHIPALT. If the application of SHIPALT

design data by revision will cause confusion or changes more than 25% of the data on an existing drawing, a new drawing shall be prepared either modifying or superseding the existing drawing.

3.2.2 Non-Expanded Planning Yard SHIPALT Drawings. Planning Yards not designated as Expanded Planning Yards by NAVSEA SL720-AA-MAN-010 shall prepare SHIPALT drawings to support accomplishment of individual SHIPALTs. There are two types of SHIPALT drawings to support this effort, Basic Alteration Class Drawings (BACDs) and Supplemental Alteration Drawings (SADs).

- a. Basic Alteration Class Drawings (BACDs). BACDs are the first complete set of drawings developed for accomplishment of a SHIPALT that requires drawings. The drawings for accomplishment of an individual SHIPALT shall form a complete drawing package or set and shall be prepared based on conditions found during a shipcheck of the first ship scheduled to receive the SHIPALT. The drawings shall be generally applicable to the other ships of the class. If the shipchecks of follow ships reveal significant differences (less than 75% of a drawing is applicable) on a follow ship or series of follow ships, the Planning Yard may prepare a new drawing for that ship or series of ships. The cognizant NAVSEA Ship Logistic Manager (SLM) or Ship Acquisition Project Manager (SPM) must authorize preparing of the new drawing(s). If the differences found on follow ships are not significant (more than 75% of the BACD is applicable), Supplemental Alteration Drawings (SADs) may be prepared to adapt the design of the BACD to the specific ship or series of ships or the BACD may be revised to indicate the differences.
- b. Supplemental Alteration Drawings (SADs). SADs are drawings that adapt the design details developed on BACDs to provide applicability to follow ships of class. SADs do not modify the requirements or scope of a SHIPALT and shall only be prepared to the extent necessary to tailor the BACD design to a specific hull or series of hulls. (Departure from the technical requirements indicated on the parent BACD or changes which affect component selection, material specifications, stress levels, stress distribution (especially on structural and piping drawings), system integration and/or functional configuration, system operational and/or maintenance characteristics, structural integrity, or compartment/topside arrangements shall require cognizant NAVSEA Engineering Directorate approval and cognizant SLM or SPM authorization. They will normally be prepared as modification drawings (see 3.4.16 (b)) and the level of detail shall be equal to that of the BACD being modified. The area(s) of the BACD being modified shall be clearly identified. In cases where a shipcheck reveals significant differences (less than 75% of a BACD is applicable) on a ship, a new drawing shall be prepared for that ship. The new drawing shall have all of the BACD design details, including the engineering data (see 3.5.10.7), adapted for that ship that the BACD has for the other ships of the class.

3.2.3 Expanded Planning Yard SHIPALT Drawings. Expanded Planning Yards (as designated by NAVSEA SL720-AA-MAN-010) shall prepare complete drawing packages, SHIPALT Installation Drawings (SIDs), to support all non-nuclear SHIPALT work scheduled to be accomplished on specific ships during specific availabilities. The drawings, as a package shall provide complete design data for all non-nuclear SHIPALTs scheduled for specific availabilities.

The drawing package may include modification drawings, superseding drawings, stand-alone drawings and revised existing drawings which provide design data for individual SHIPALTs, and may also include integrated design drawings. Integrated design drawings represent work required by two or more SHIPALTs, usually to be accomplished in the same space or area of the ship and would be scheduled to be accomplished at the same time. These drawings may include rip-out drawings (see 3.5.10), temporary access/egress drawings, and arrangement drawings (see 3.5.9) and are generally applicable to only one ship. (Integrated design drawings shall not be prepared unless it is clearly advantageous to do so and the drawings shall clearly indicate the extent of work for each SHIPALT included on the drawing.)

3.2.4 Restrictive Data. Unless otherwise specified by NAVSEA, individual drawings in a drawing package shall not include the following:

- a. SHIPALT drawings shall invoke only Government or other universally accepted procedures, standards or specifications such as those specified in NAVSEA 0902-018-2010 or NAVSEA S9AA0-AB-GOS-010. Planning Yard or other local procedures, standards or specifications may be invoked in conjunction with the applicable government specifications (such as in parenthesis following the government specification) only when all requirements of the government specification are invoked in the local specification. (Until such time as NAVSEA Standard and Type Drawings can be updated, the use of Planning Yard Standard Drawings shall be permitted as references on SHIPALT drawings, if they are listed as required references in the applicable Planning Yard-prepared Ship's Availability Drawing Schedule.)
- b. Original builder's specifications, contract drawings, and contract guidance drawings. These are not available at most activities and shall not be referenced directly on SHIPALT drawings.
- c. Reference to any specific availability or overhaul.
- d. Reference to the shipyard assignment for any ship.
- e. Reference to any miscellaneous information or Notes relating to operations or procedures peculiar to a specific shipyard or activity unless it is clearly delineated that the information pertains only to a specific activity. For example, following the miscellaneous information or Notes with '(for PSNS only)'.
- f. Material specifications based on the material's availability in the Planning Yard's shipyard stock. To the maximum extent possible, material shall be selected on the basis of its suitability and of its general availability, according to the best information held by the Planning Yard, to all installing activities.
- g. Specification of proprietary material, unless the Planning Yard determines that there is no generic equivalent. If proprietary material is required, complete ordering information shall be provided on the drawing.
- h. References to proprietary vendor drawings unless required for ordering information (see 3.2.4 (g)).
- i. Material part numbers or stock numbers which are peculiar to a given activity's stock system unless handled in a manner similar to e. above.

3.2.5 Computer Aided Design (CAD). In nearly all instances, SIDs will be developed using a CAD application. This provides significant benefits in efficiency and accuracy, as well as

reusability. When CAD files are generated they must follow a consistent set of CAD Standards with regards to layers, line weights, line fonts, and standard library parts inserted. Specific CAD Standards are not mandated as long as the CAD drawings are developed in a consistent manner. (The Planning Yards at PSNS, NNSY and NGNN have published a CAD Standard which is available for other activities to use.) The electronic drawing files must be backed-up and archived in accordance with NAVSEA requirements.

3.3 Responsibilities.

3.3.1 Planning Yard. The Planning Yard for each ship class, as designated by NAVSEA SL720-AA-MAN-010, is the engineering design agent for assigned specific classes of ships. Responsibilities assigned to the Planning Yard (both Expanded and Non-Expanded) in support of SHIPALT drawings include the following:

- a. Developing basic SHIPALT engineering design
- b. Developing detail design drawings for accomplishment of SHIPALTs as described in 3.2.2 and 3.2.3.
- c. Performing shipchecks, as required, to accomplish the following:
 1. Determine lead ship design (performed prior to or after actual drawing preparation, but must be conducted on applicable ships prior to issuance of the drawing) to support specific availabilities.
 2. Determine drawing adequacy and applicability to follow ships of a class (performed prior to or after actual drawing preparation, but must be conducted on applicable ships prior to issuance of the drawing) to support specific availabilities.
 3. Conduct proofing (Validation) of SHIPALT drawings (performed as part of proofing of SHIPALT design for SHIPALT records (SARs) which require proofing after SHIPALT accomplishment on the first ship to receive the SHIPALT).
 4. Verify the design and applicability of high risk or complex SHIPALT drawings. This is to be limited to those alterations that are high risk and where the Planning Yard has reason to believe that the drawings or the design presented on the drawings may be inadequate. The NAVSEA SLM/SPM is to be notified in advance of the shipcheck. This shipcheck may also be conducted by the installing activity/SUPSHIP when approved by the Planning Yard.
- d. Approve drawings.
- e. Providing resolution to problems with SHIPALT drawings encountered by overhaul yards via the liaison action record (LAR) procedure in accordance with NAVSEA Technical Specification 9090-100.
- f. Maintaining a central drawing file of all Master File Drawings, including CAD files, applicable to the ships for which the Planning Yard is responsible.
- g. Developing SHIPALT man-day and material cost estimates as part of BACD or SID preparation. A SHIPALT cost Estimate Record Sheet, Figure S4-4 of Section 4.6.3.3 of NAVSEA SL720-AA-MAN-010, shall be appropriately completed by the Planning Yard and submitted to the cognizant SLM or SPM within 30 days of completion of BACDs or SIDs.
- h. Maintain configuration control.

3.3.2 NAVSEA Engineering Directorate. NAVSEA Engineering Directorate (NAVSEA 05) is the activities responsible for the SHIPALT technical products. This includes:

- a. SHIPALT review and approval requirements will be established by the NAVSEA Engineering Directorate Office responsible for each SHIPALT, on a case basis or the requirements of NAVSEA 0902-018-2010 or NAVSEA S9AA0-AB-GOS-010 shall be specified. Requirements will be specified in the SHIPALT Record (SAR) (see NAVSEA Technical Specification 9090-500).
- b. Conducting in-process reviews during the development of the technical products of major SHIPALTs. In-process reviews will be conducted when either the Engineering Directorate or the cognizant SLM/SPM determine such a review is required for a particular SHIPALT. Review requirements will be specified in the SAR.
- c. Performing technical review and approval of major changes, waivers and deviations to SHIPALT documentation in accordance with procedures for controlling engineering changes to SHIPALTs, NAVSEA Technical Specification 9090-100.

3.4 Drawing Preparation Requirements. Drawings and associated lists shall be prepared as engineering drawings in accordance with the general drafting practices outlined in DOD-STD-100, as defined herein, and as modified by NAVSEA 0902-018-2010 or NAVSEA S9AA0-AB-GOS-010, as specified in the contract or tasking documentation.

3.4.1 General.

3.4.1.1 Quality. Within the requirements of DOD-STD-100, MIL-DTL-31000, and the direction contained herein. Planning Yards shall provide drawings for SHIPALT accomplishment, as tasked, which are timely, accurate, and as suitable for direct use as a stand-alone drawing package by installing activities as possible. Installing activities are to use these drawings with a minimum of departure to promote standardization and reduce ship differences in a given class.

3.4.1.2 Quantity. When the SHIPALT design affects the configuration of other systems, compartments, or spaces adjacent to the system or area directly affected by the SHIPALT, sufficient drawings shall be prepared to reflect the rearrangement and reconfiguration of such systems, compartments or spaces. (For submarines only - For SHIPALTs included on approved Baseline Arrangement Drawings, arrangement drawings shall reflect the approved baseline or the Planning Yard shall request departures in accordance with NAVSEA 0902-018-2010. For SHIPALTs not included on baseline drawings, NAVSEA approval of arrangements drawings shall be as specified in the SAR.)

3.4.2 Drawing Sheet Sizes and Format.

3.4.2.1 Drawing Sheet Sizes. Drawing sheet sizes shall be size "A", "B", "C", "D", or "F" as indicated in ANSI/ASME Y14.1. For specific drawings, such as some system diagrams which must be shown as one continuous drawing and will thereby exceed the length of a single size "F" sheet, "H" roll size sheets shall be utilized as described herein.

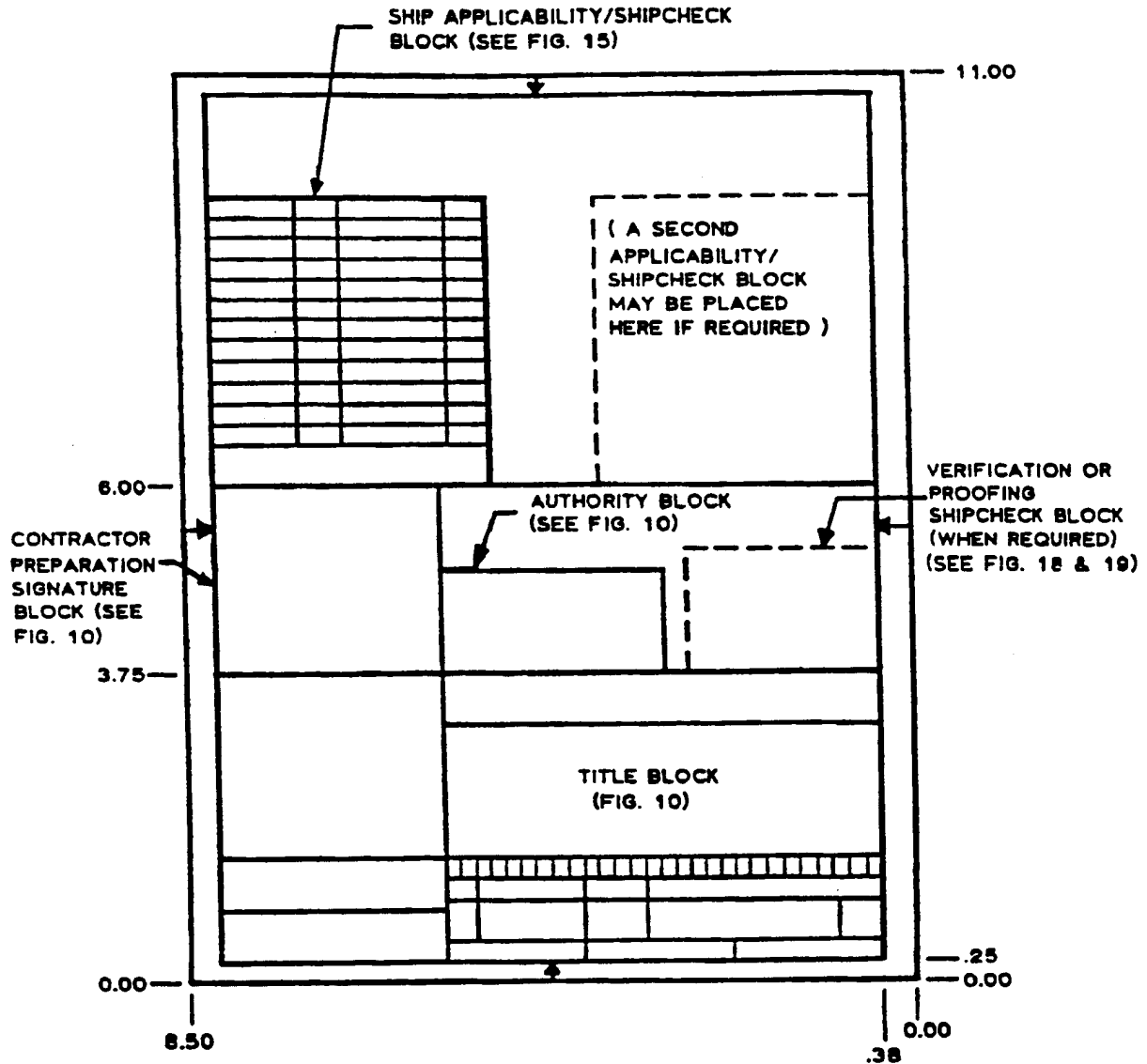
- a. Size "A" sheets shall be used where information is primarily text or is limited to notes and small sketches. Except for tabular type drawings (e.g. cable running sheets or

engineering calculations), size "A" drawings will be generally limited to ten data sheets or less. All size "A" drawings exceeding ten sheets shall also include an index sheet.

- b. Size "B", "C" and "D" sheets shall be used for intermediate size drawings where the data is not appropriate for size "A" sheets and has insufficient information to justify size "F" sheets.
- c. Size "F" drawings shall be used for most large drawings. Drawings which must be prepared as a single continuous drawing (not multiple sheets) such as some system drawings and deck drawings of large ships and will therefore exceed the length of size "F" sheets, shall be prepared as size "H" drawings.
- d. Size "H" drawings shall only be used for drawings which must display information on one continuous sheet which would exceed the length of a single size "F" sheet or would be confusing if prepared as a multiple sheet drawing. This would include complex piping and wiring system diagrams, arrangements of flight and hanger decks, arrangements of antennas and deck machinery, power and lighting wiring deck plans for large ships, etc. Size "H" drawings shall be prepared as single, continuous, multi-frame drawings with no single frame exceeding 44 inches in length. The final frame shall be 11, 23, 33 or 44 inches in length. There shall be no second sheets for "H" size drawings: the title block shall always indicate the sheet number as "SHEET 1 OF 1".

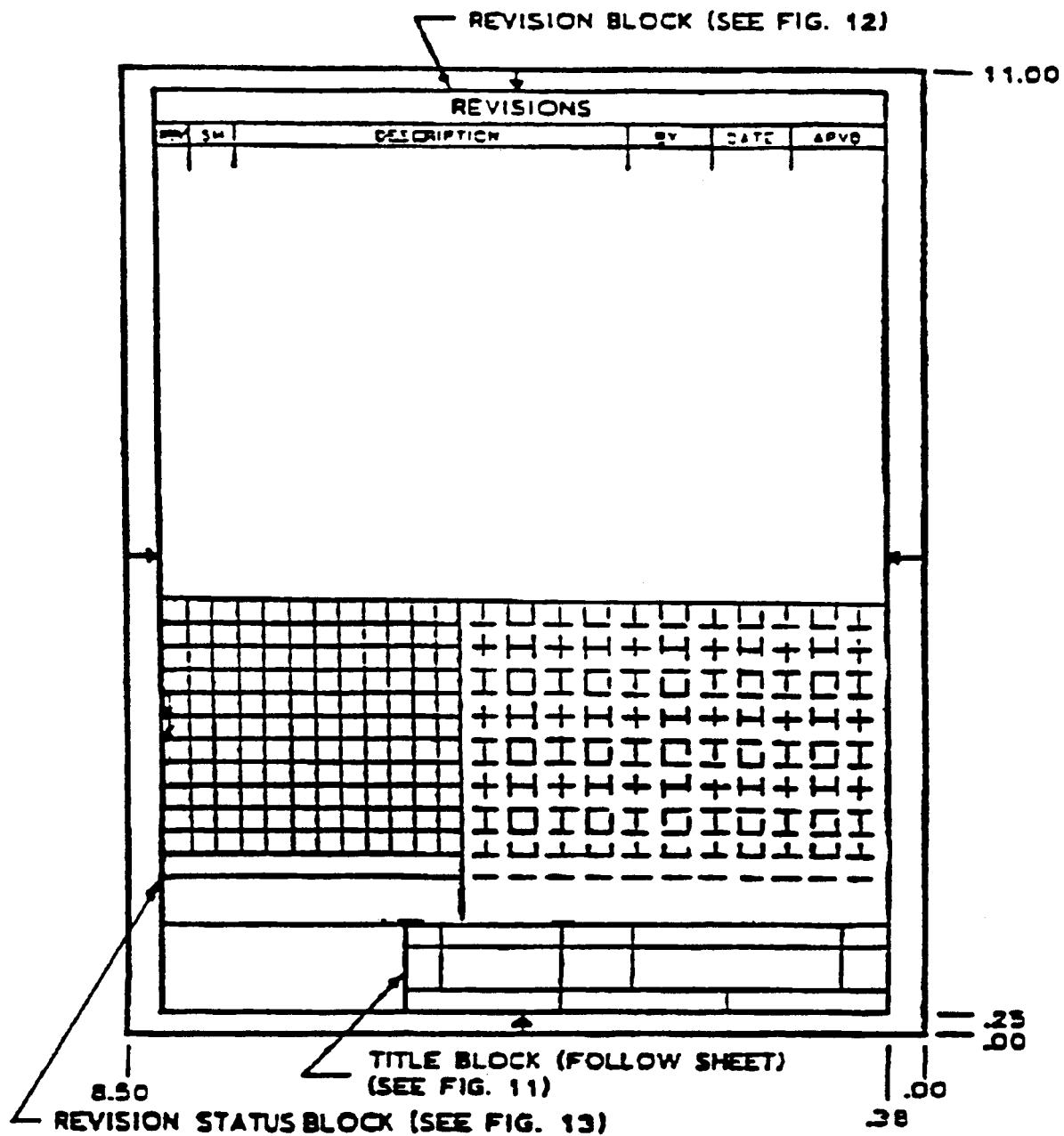
3.4.2.2 Drawing Sheet Formats. Figures 1 through 9 provide the basic drawing sheet formats to be used for non-nuclear NAVSEA drawings. In preparation of these formats, especially as reproducible format masters, the following guidance shall be utilized:

- a. **Margins.** The margin sizes shall be selected to permit reproduction of drawings on sheets that conform to this specification or international paper sizes.
- b. **Zoning.** Except for size "A" and "B" formats, all NAVSEA drawings shall include zones for reference purposes. Where used, zones are indicated by alphabetical and numerical entries in the format margins as indicated in figures 6, 7, 8 and 9. Horizontal zones on continuation sheets shall be lined in but not numbered as part of the format. (The numbering of zones on continuation sheets is provided as part of drawing preparation.)
- c. **Format Lettering.** The size and style of lettering printed on drawing formats shall be in accordance with ANSI/ASME Y14.2.
- d. **Format Lines.** Width of lines in format features shall conform to the following:
 - 1. Thick (approximately 0.030 in.) lines shall be utilized for borderlines, outlines of principal blocks and main division blocks.
 - 2. Thin (approximately 0.015 in.) lines shall be utilized for divisions of parts, material and equipment lists and revision and reference blocks, minor subdivisions of title blocks and supplementary blocks, and zone markers.

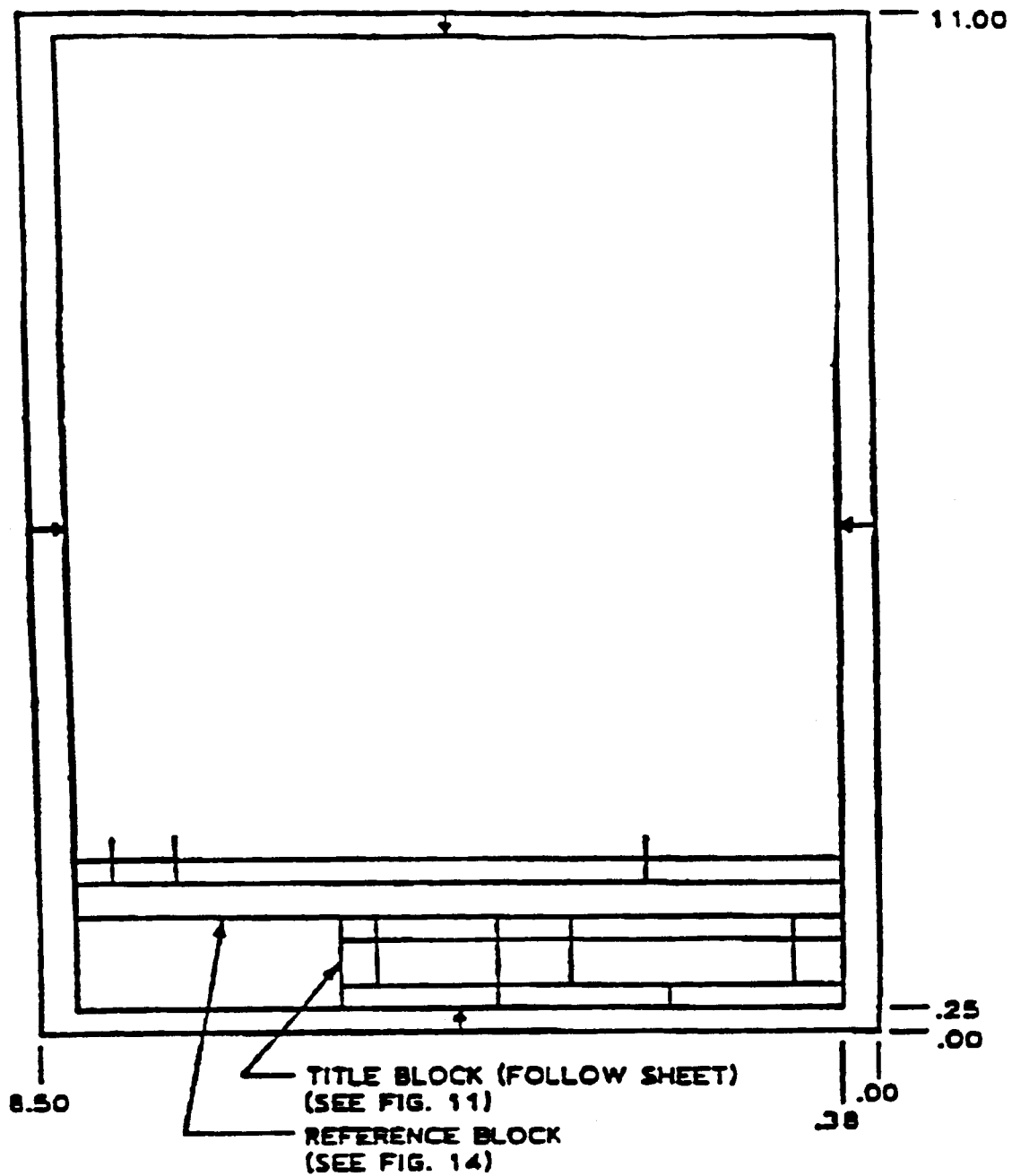


TITLE (FRONT) SHEET
SIZE "A" FORMAT

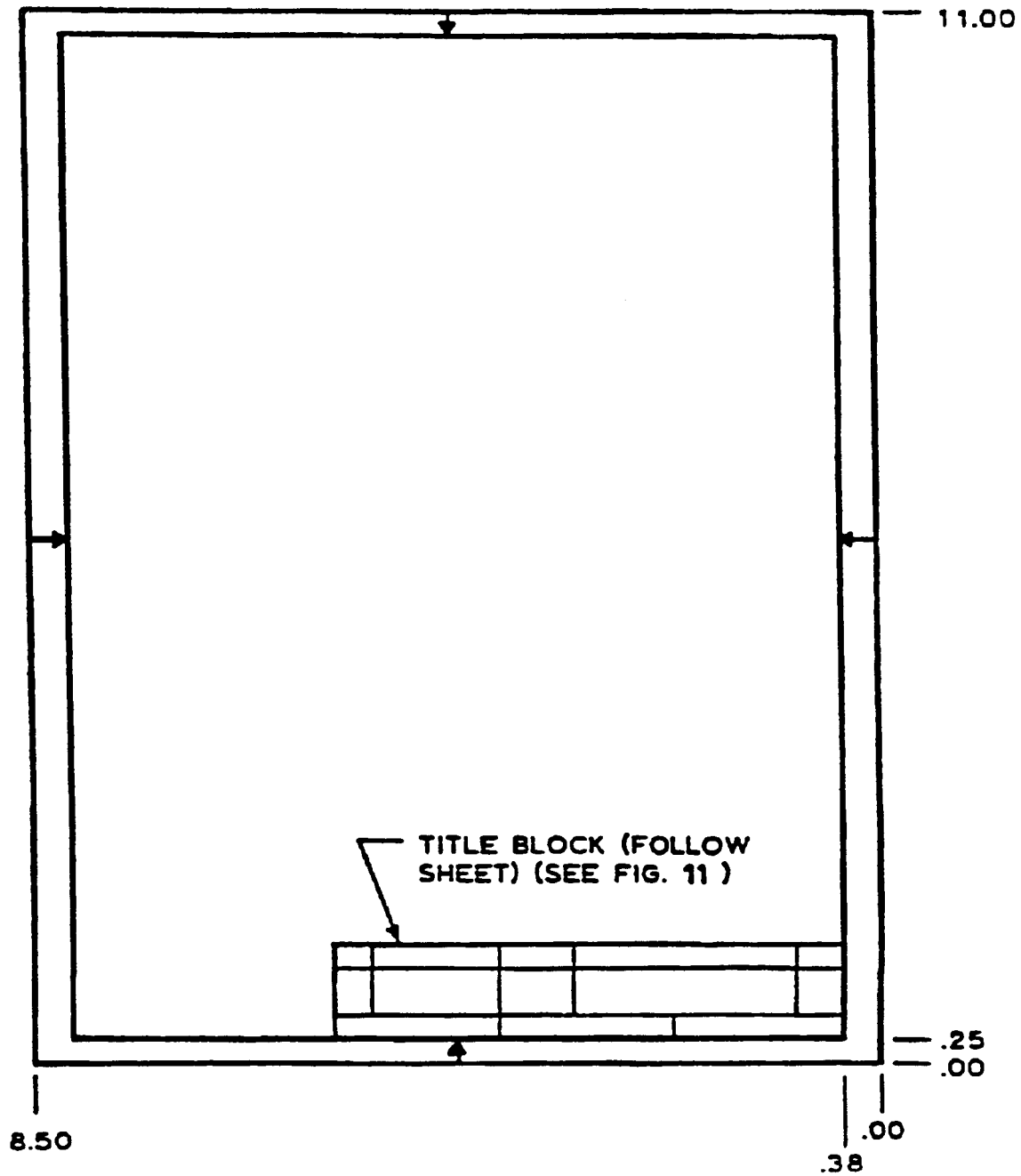
FIGURE 1



REVISION DESCRIPTION SHEET
SIZE "A" FORMAT
FIGURE 2



REFERENCE AND REVISION STATUS
SIZE "A" SHEET FORMAT
FIGURE 3



INFORMATION SHEET
SIZE "A" FORMAT
FIGURE 4

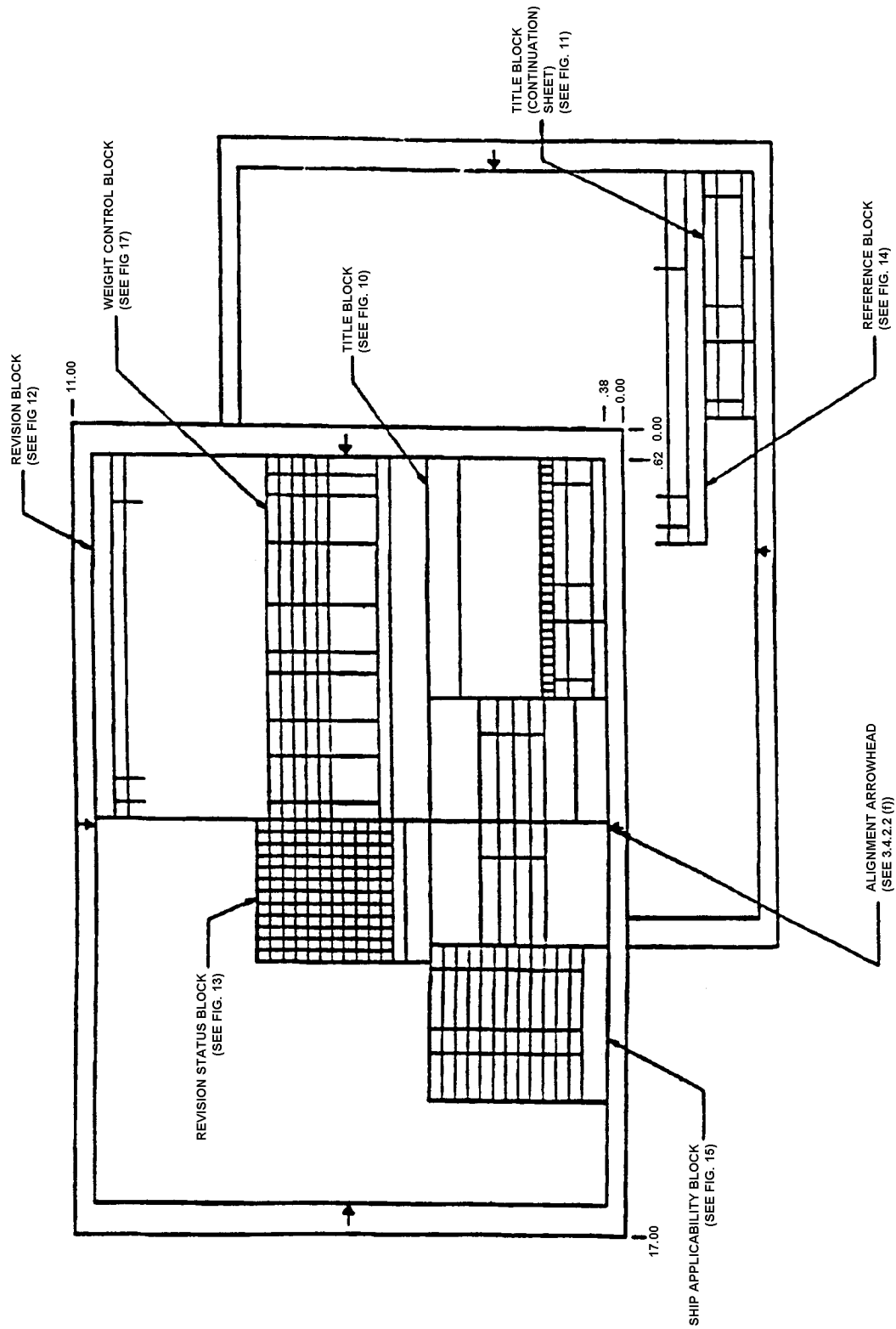


FIGURE 5

SIZE "B" SHEET FORMAT

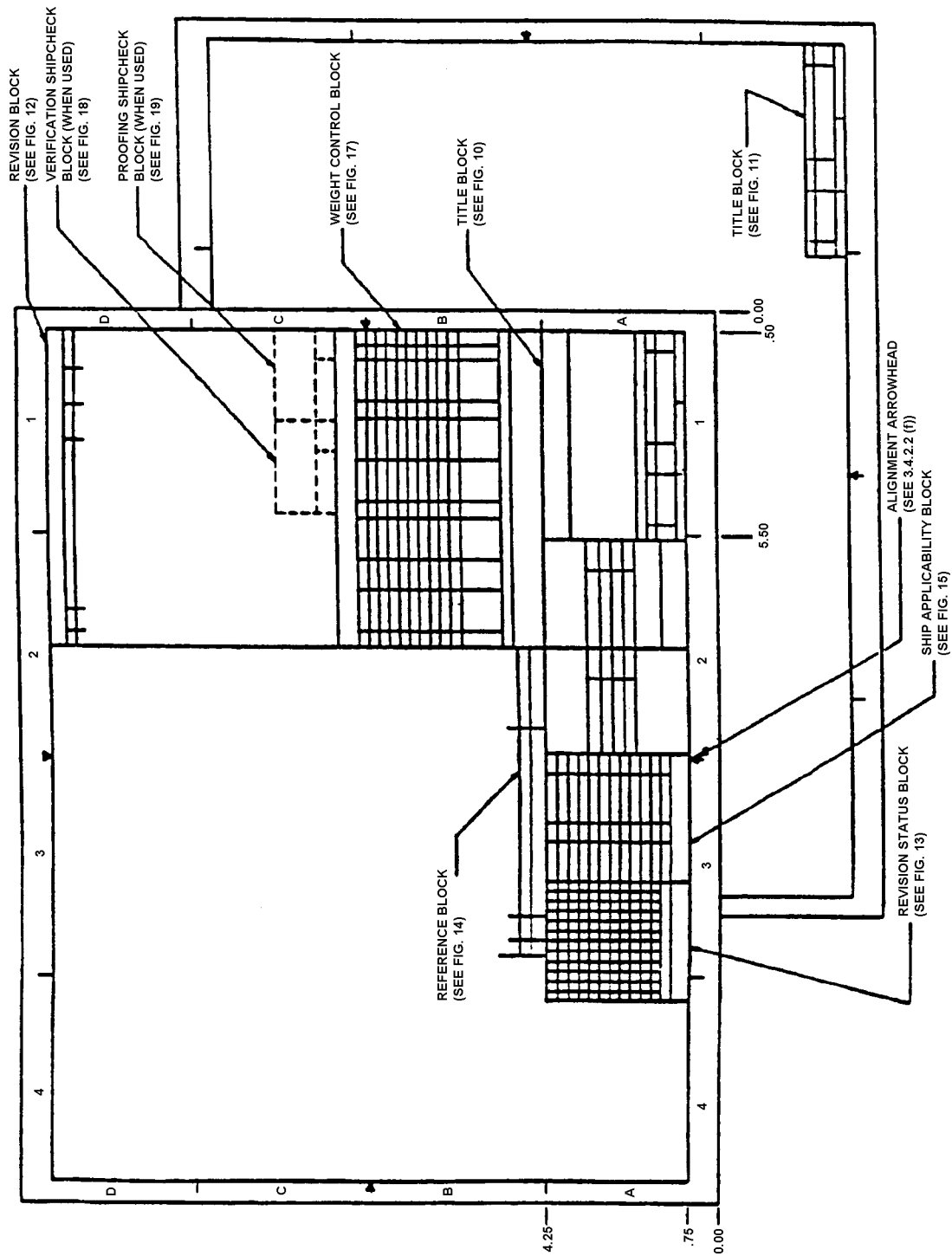


FIGURE 6

SIZE "C" SHEET FORMAT

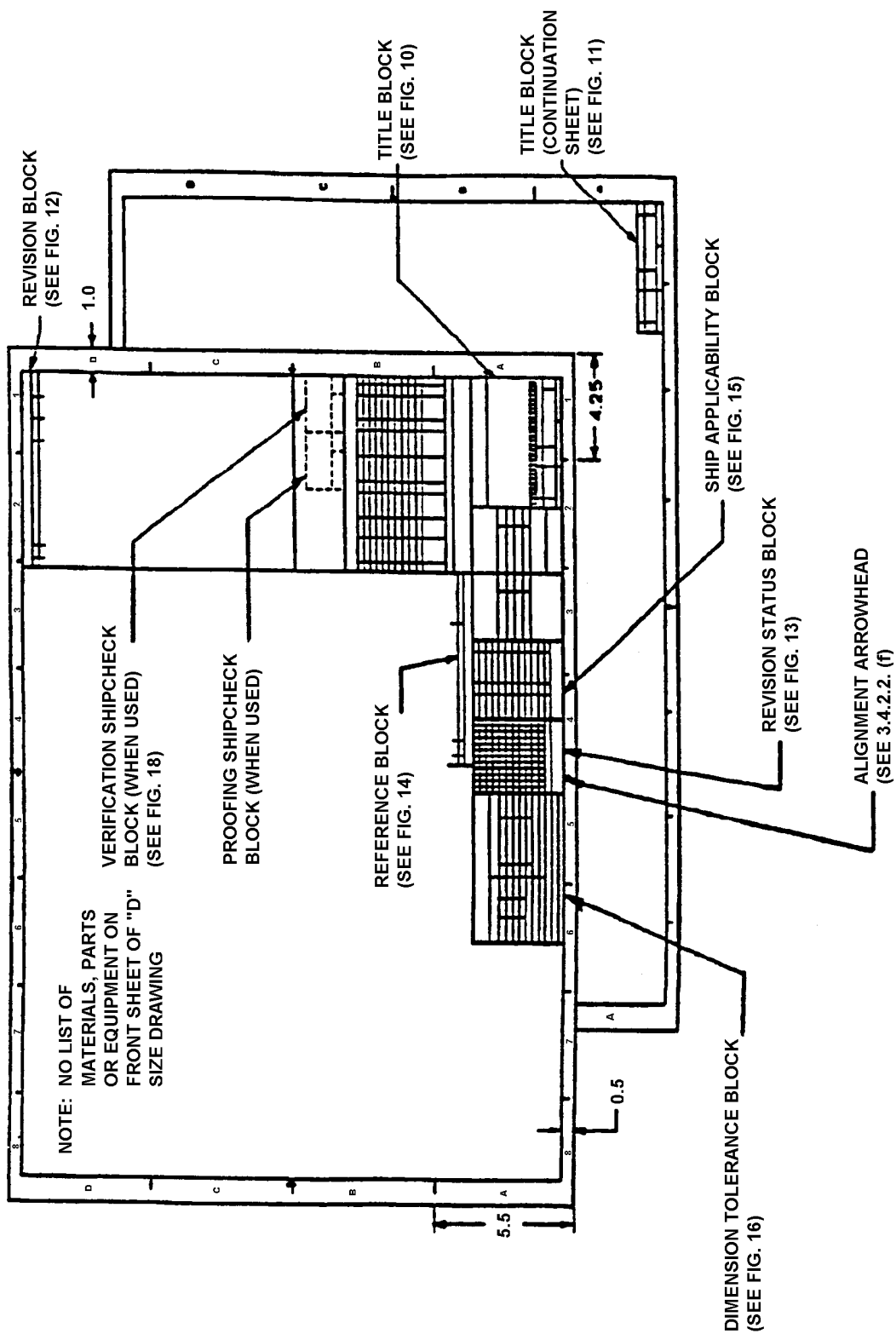


FIGURE 7

SIZE "D" SHEET FORMAT

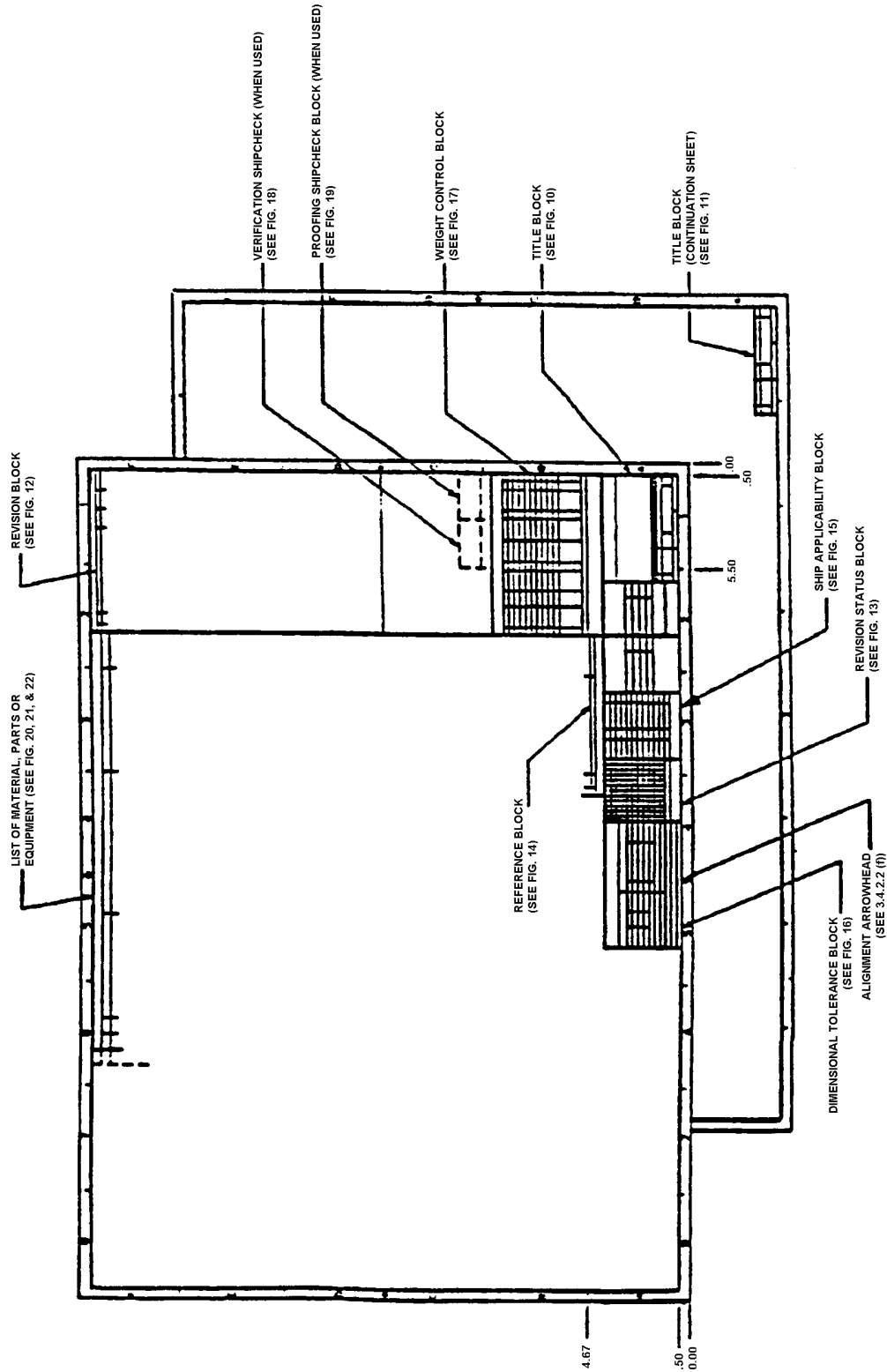


FIGURE 8

SIZE "F" SHEET FORMAT

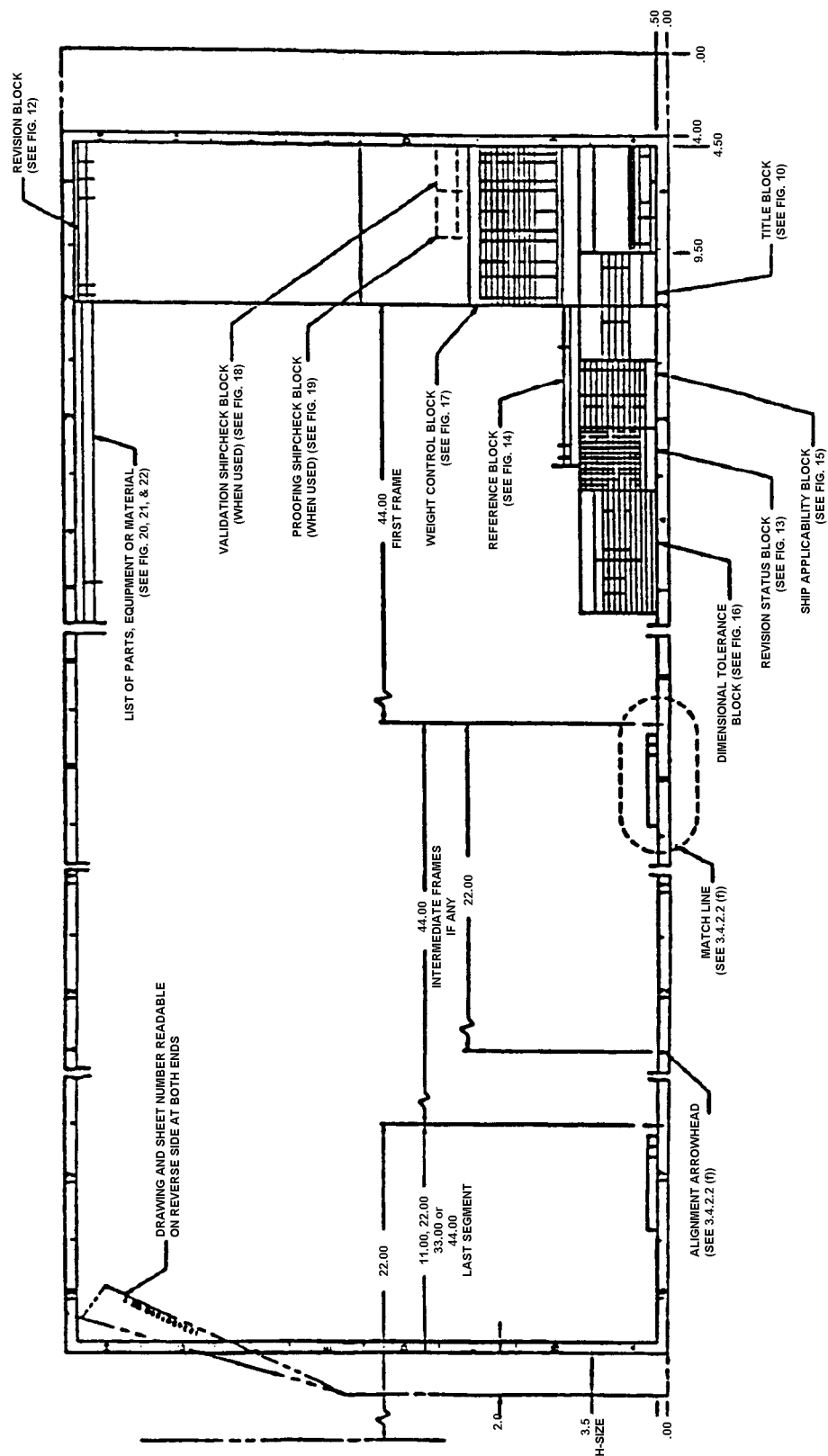
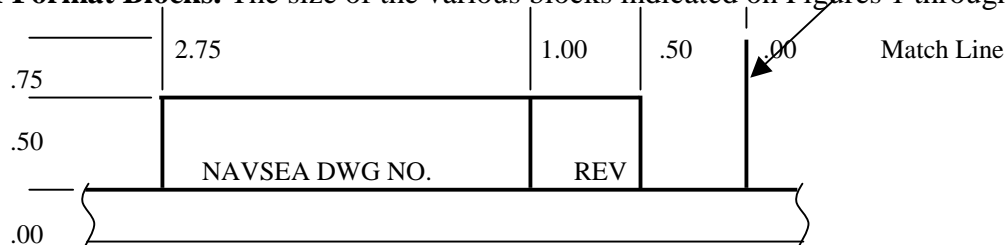


FIGURE 9

SIZE "H" DRAWING FORMAT

Size of Format Blocks. The size of the various blocks indicated on Figures 1 through 9 shall be



in accordance with 3.4.3 and Figures 10 through 22.

3.4.3 Drawing Block Formats. Drawing block formats shall be in accordance with the appropriate figures as follows:

- a. Title/signature block (front sheet) (Figure 10)
- b. Title block (continuation sheets) (Figure 11)
- c. Revision block (Figure 12)
- d. Revision status block (Figure 13)
- e. Reference list block (Figure 14)
- f. Applicability/shipcheck block (Figure 15)
- g. Dimensional tolerance block (Figure 16)
- h. Weight control block (Figure 17)
- i. Verification Shipcheck block (Figure 18)
- j. Proofing Shipcheck block (Figure 19)
- k. List of Parts block (Figure 20)
- l. List of Material block (Figure 21)
- m. List of Equipment block (Figure 22)

3.4.4 Line Conventions and Lettering. Line conventions and lettering shall be in accordance with the ANSI/ASME Y14.2.

3.4.5 Multi and Sectional View Drawings. Multi and sectional view drawings shall be in accordance with ANSI/ASME Y14.3. The application of space geometry and space analysis included as appendices in ANSI/ASME Y14.3 shall not be included in NAVSEA drawings unless otherwise specified in the contract or tasking documentation.

3.4.6 Dimensions and Tolerance Levels. Dimensions and tolerance levels of NAVSEA drawings shall be in accordance with ANSI/ASME Y14.5. Drawings shall utilize U.S. customary units (non-metric units) unless otherwise specified in the contract or tasking documentation (dual dimensions shall not be utilized). Use of fractional or decimal dimensions is left to the option of the Planning Yard, but shall be consistent throughout the drawing. Both decimal and fractional dimensions may be utilized on drawings that contain machining details (decimals) as well as structural/equipment/piping details (fractions). Graphic and architectural symbols specified in ANSI/ASME Y14.5 shall not be used. Requirements for these symbols are covered elsewhere in this specification.

3.4.7 Abbreviations. Abbreviations used on drawings shall be used only where the limitation of space or conservation of significant drafting time dictate. When required, abbreviations shall be

in accordance with ASME Y14.38. A note shall explain abbreviations not covered in this standard on the drawing.

3.4.8 Reference Designations. Reference designations for electrical and electronic equipment shall be in accordance with ANSI Y32.16.

CONTRACT SIGNATURE BLOCK
SIZE "A" SHEET ONLY

AUTHORITY BLOCK
SIZE "A" SHEET ONLY

CONTRACT NO. 15828		SUPERVISOR OF SHIPBUILDING		DEPARTMENT OF THE NAVY	
FSCM NO. G.H. SMITH, INC.		CONVERSION & REPAIR		NAVAL SEA SYSTEM COMMAND	
MARLTON S.D. 08038		USN		WASHINGTON D.C. 02382	
PREPARED	DATE	PREPARED	DATE		
CHECKED		CHECKED			
ENGINEER		ENGINEER			
APPROVED		APPROVED			
AUTHORITY:		ACCEPTED FOR NAVSEA		SIZE FSCM NO. WTGRP NAVSEA DRAWING NO REV	
		APPROVED BY NAVSEA		53711	
		SCALE:		SHEET 1 OF	

(28) TYP .183 SPACES

1.25
1.00
.75
.25
0.00

0.00 10.35 7.74 5.88 4.75 3.50 2.75 1.75 0.00

8.49 5.13

0.00 1.02 1.33 1.64 1.95 2.26 2.88 3.50

FIGURE 10

TITLE BLOCK (FRONT SHEET)

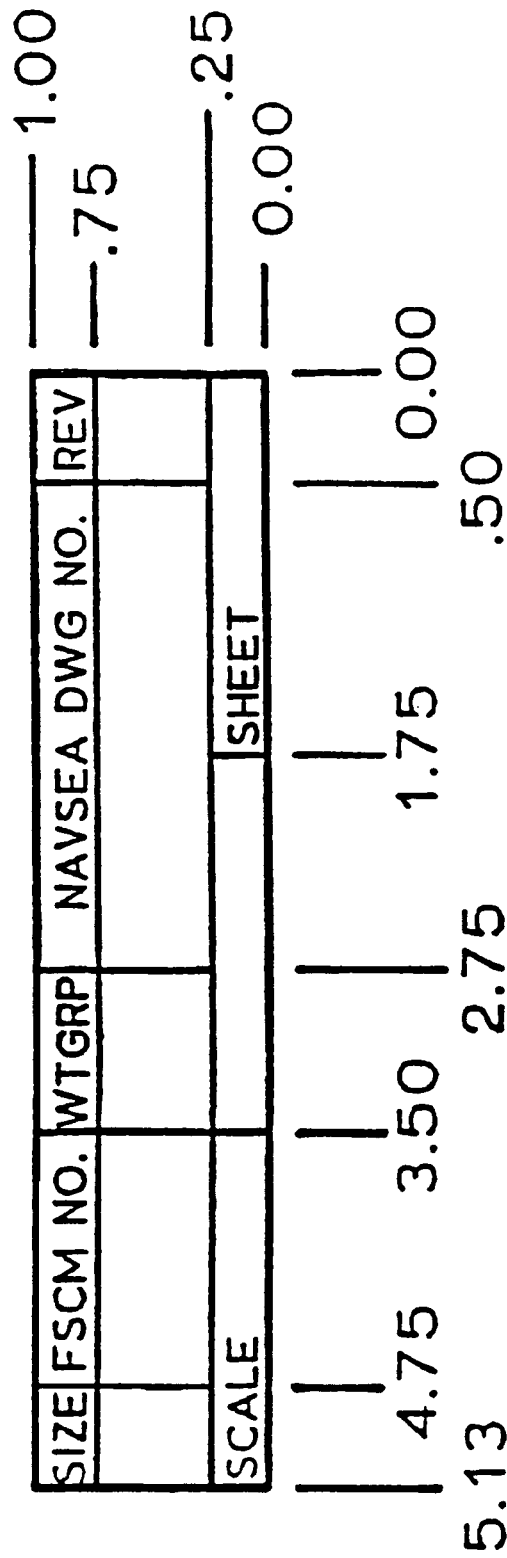


FIGURE 11

TITLE BLOCK CONTINUATION SHEETS

REVISIONS				
REV	DESCRIPTION	BY	DATE	APPROVED
7.74	6.86	2.76	1.88	1.00
7.36				0.00

FIGURE 12

* "SHEET" FOR SIZE "A" FORMATS
"ZONE" FOR SIZE "B", "C", "D", "F" AND "H" FORMATS

REVISION BLOCK

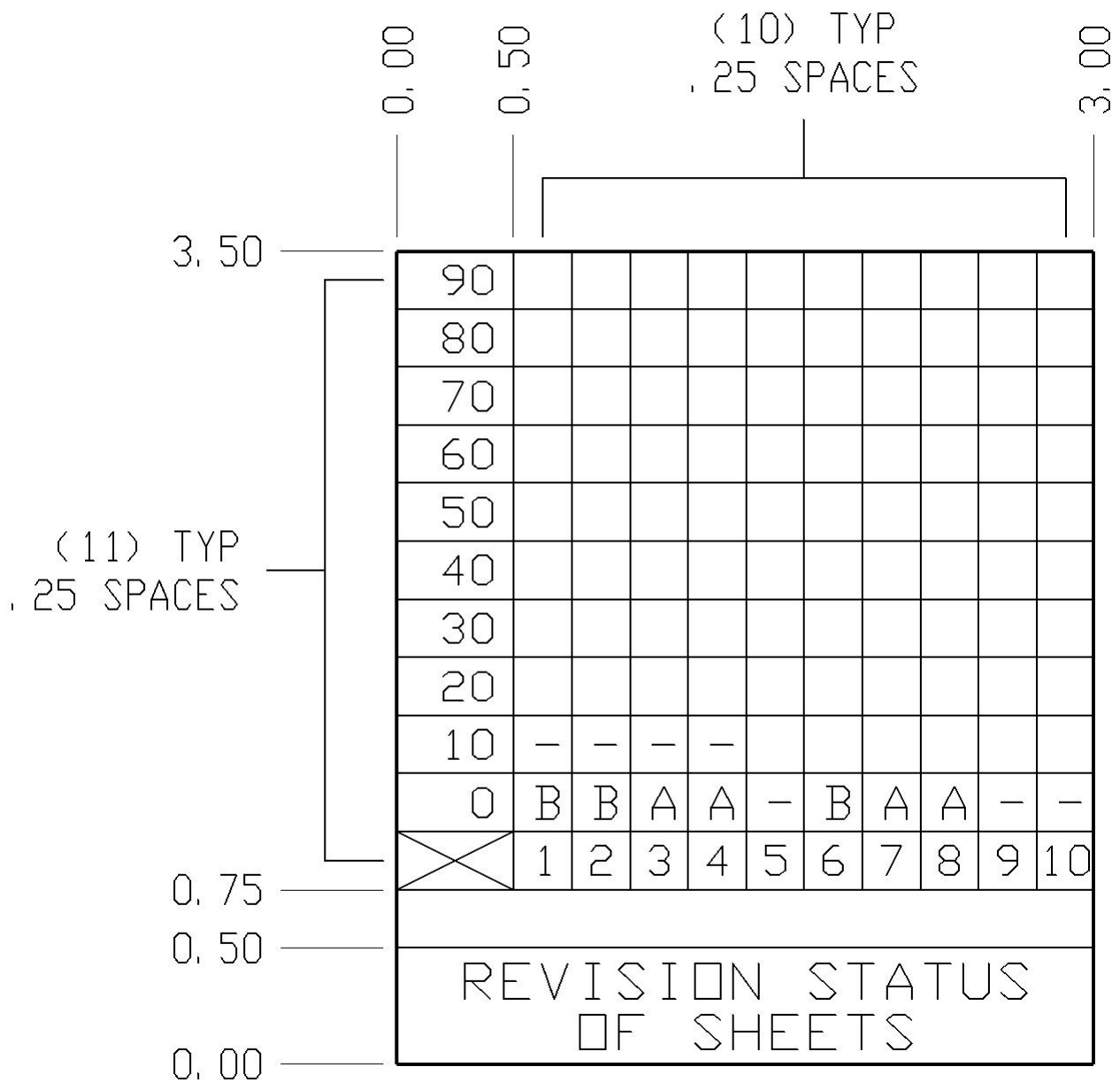
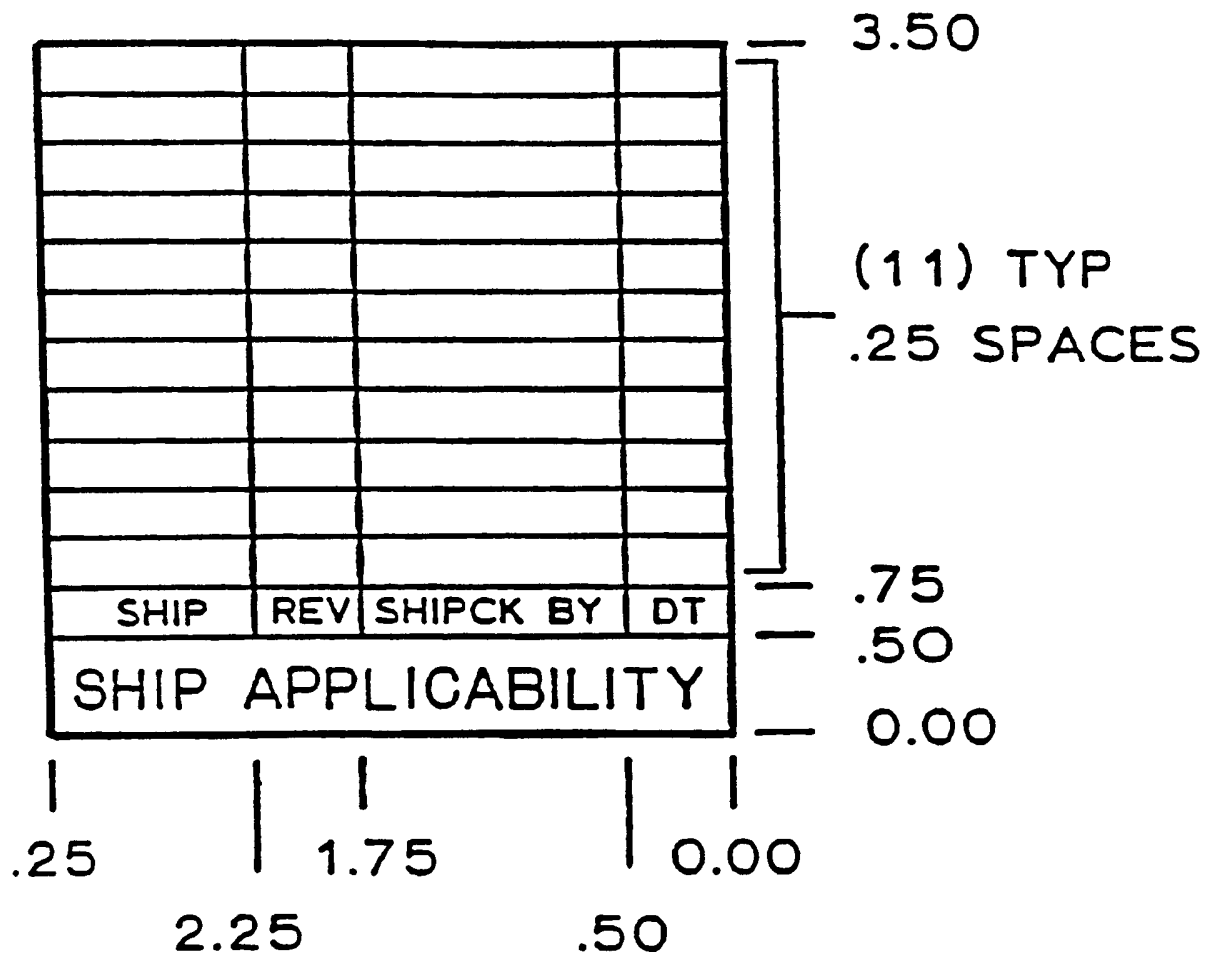







FIGURE 13



SHIP APPLICABILITY/SHIPCHECK BLOCK
FIGURE 15

DIMENSIONAL TOLERANCES—UNLESS OTHERWISE SPECIFIED					
MACHINED			GEOMETRIC (WHERE INDICATED)		
DIMENSION (IN)	DECIMAL		SYMBOL	GEOMETRY	TOLERANCE
	2 PL	3 PL			
UNDER 6	±.010	±.005		FLATNESS	.0005 /IN
6 TO 24	±.020	±.010		PERPENDICULAR	.001 /IN
OVER 24	±.030	±.015		PARALLELISM	.001 /IN
FILLETS & RADII TO BE 1/8				CONCENTRICITY	AS NOTED
TOL ON ANGLES ±0-30°				STRAIGHTNESS	.0005 /IN
			SYM IAW ANSI Y14.5M-1982		

8.75	7.38	6.63	5.88	4.56	4.50	3.38	1.50	0.00
------	------	------	------	------	------	------	------	------

(6) TYP
0.38 SPACES

FIGURE 16

DIMENSIONAL TOLERANCE BLOCK

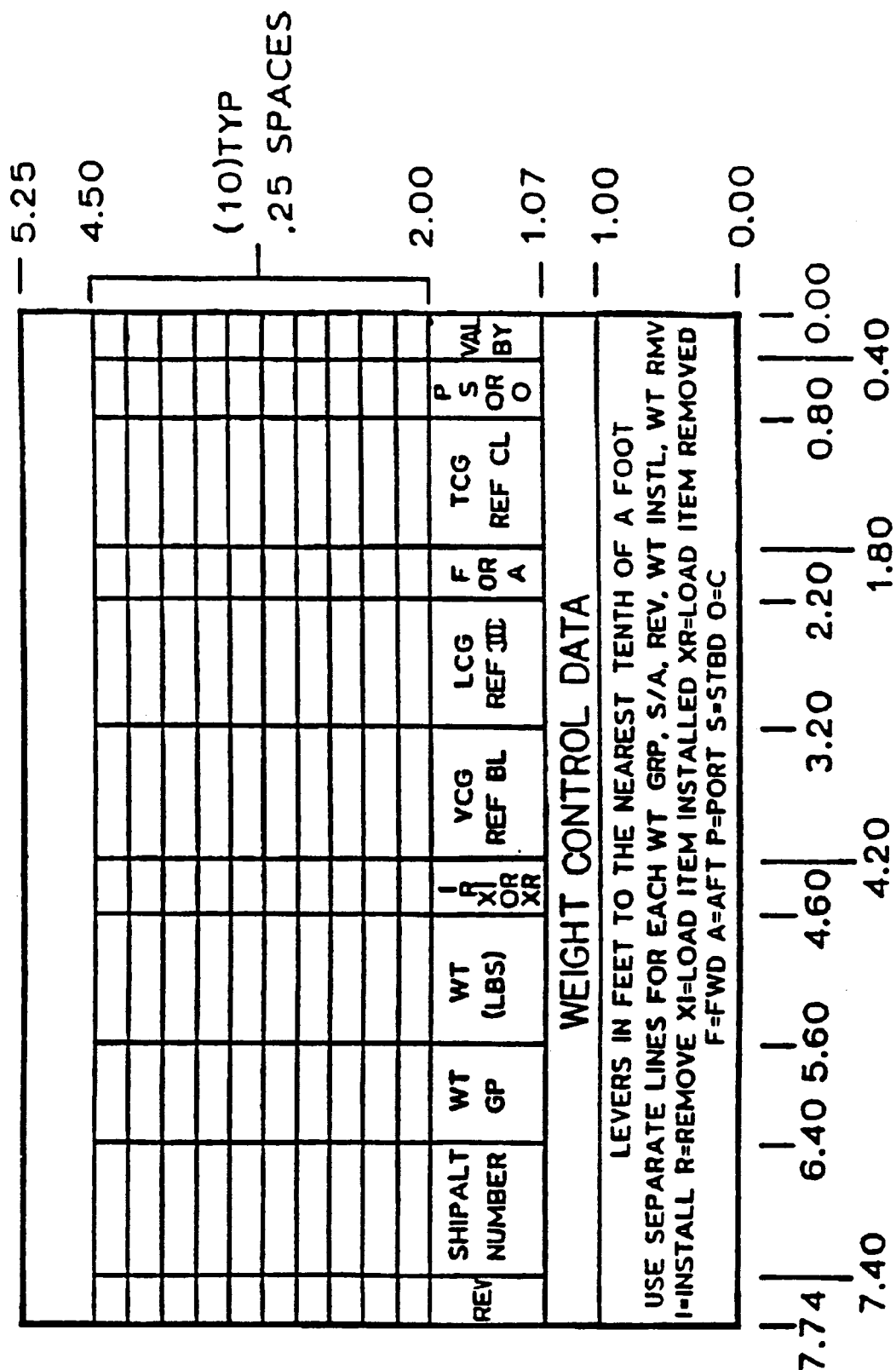
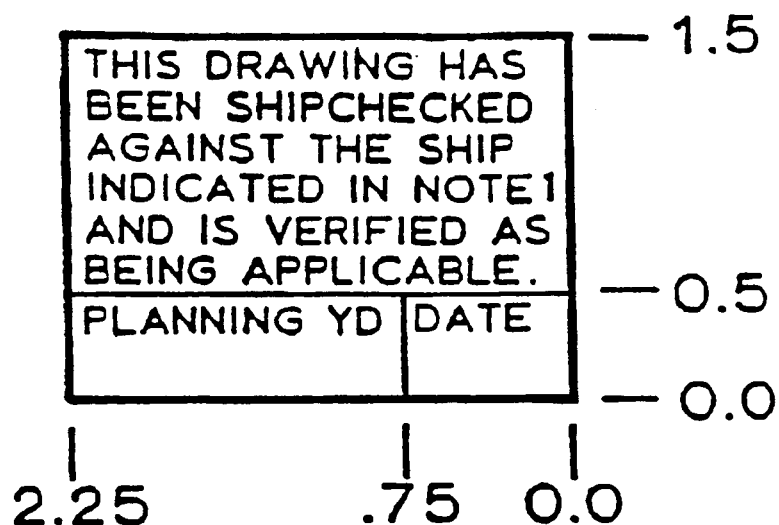


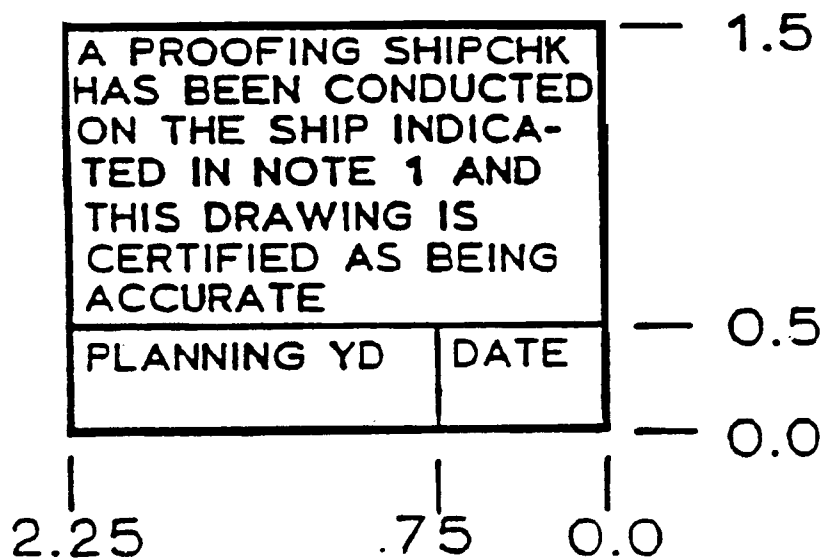
FIGURE 17

WEIGHT CONTROL DATA BLOCK



VERIFICATION SHIPCHECK BLOCK

FIGURE 18



PROOFING SHIPCHECK BLOCK

FIGURE 19

[illegible]

FIGURE 20

LIST OF PARTS

[illegible]

STRUCTURAL

LAST SIZE USED ROD	MTL SPEC	MTL REQ	NSN OR MF OR PT NO	RCE	A/L NO.	UNIT	REMARKS
13.50							
12.50							
10.50							
9.25							
6.75							
5.25							
4.50							
0.00							

MACH. PIPING
HVAC

[illegible]ELECTRICAL/
ELECTRONIC

MTL SPEC	MTL REQ	NSN OR NF OR PT NO.	SCE	AIL NO.	UNIT WT	REMARKS
13.50	11.50	10.25	8.25	6.25	5.50	0.00

LIST OF MATERIALS

FIGURE 21

[illegible]**FIGURE 22**

LIST OF EQUIPMENT

TABLE 1
MINIMUM LETTER HEIGHTS FOR DRAWINGS
(Extracted from ANSI/ASME Y14.2)

USE	INCH (FREEHAND)	INCH (CAD)	DRAWING SIZE
Drawing Number in Title Block	5/16 (.312)	.290	Larger than 'C'
	1 / 4 (.250)	.240	'C' or Smaller
Drawing Title	1 / 4 (.250)	.240	All
Section and Tabular Letters	1 / 4 (.250)	.240	All
Zone Letters and Numerals in Borders	3/16 (.188)	.175	All
Dimensions, Tolerances, Limits, Notes, Subtitles for Special Views, Table, Revision, and General Lettering for the Body of the Drawing	5/32 ** (.156)	.120 *	'C' or Smaller
	5/32 ** (.156)	.140	Larger than 'C'

* For CAD or computer generated lettering, .120" lettering is permitted; otherwise .140" lettering shall be the minimum letter height permitted.

** In variance with ANSI/ASME Y14.2

3.4.9 Type Designations. Equipment type designations used on drawings shall conform to MIL-STD-196 for electronics equipment or other appropriate documents for other types of equipment (see DOD-STD-100).

3.4.9.1 Equipment Subdivisions. Equipment subdivisions shall be in accordance with MIL-HDBK-505.

3.4.10 Hull, Structural and Mechanical Graphic Symbols. Hull, structural and mechanical graphic symbols for use on all NAVSEA drawings shall be as follows:

- a. Structural graphic symbols shall be in accordance with MIL-STD-25.
- b. Welding graphic symbols shall be in accordance with MIL-STD-22 and ANSI/AWS A2.4. In case of conflict between these specifications, MIL-STD-22 shall take precedence.
- c. Fluid power graphic symbols for diagrammatic drawings shall be in accordance with ANSI/ASME Y32.10.

- d. Pipe fitting, valve and piping graphic symbols for diagrammatic drawings shall be in accordance with NAVSEA Dwg. No. 803-5001049, except for fluid power systems (see 3.4.10(c)).
- e. Heating, ventilation and air conditioning graphic symbols for diagrammatic drawings shall be in accordance with ANSI Y32.2.4.

3.4.11 Electrical and Electronic Graphic Symbols. Electrical and electronic graphic symbols for schematic diagrams shall be in accordance with ANSI/ASME Y32.2. Symbol numbers, where used for standard electrical equipment, shall be in accordance with MIL-HDBK-290.

3.4.12 Security Classification. Security classification for drawings shall be marked in accordance with SECNAVINST 5510.30 and SECNAVINST 5510.36.

3.4.13 Drawing Scale. Drawing scale, where utilized, shall be indicated using the architectural method (example: 1/2" = 1'-0, 6" = 1'-0) in lieu of the fractional method. To allow for overlaying and ease of interference control, drawings for the same SHIPALT shall, where feasible, be drawn to the same scale for drawings such as arrangements, foundations, ventilation, piping, etc. As an option, each sheet may have a bar scale (graphic scale) for each scale-utilized on that sheet. Bar scales shall show both vertical and horizontal dimensions.

3.4.13.1 Arrangement Scale. General and Machinery Arrangement drawing scales shall be not less than 1/4" = 1' 0".

3.4.14 Drawing Materials. Materials used in the preparation of NAVSEA drawings shall be of the type and quality that will assure legibility and reproducibility.

3.4.15 Final Drawings. Final drawings, whether an original tracing or an electronic file, must show all required approvals. For electronic drawing files, per NAVSEA guidance, a signature can be signified with '/s/' after the typed name of the signer.

3.4.16 Revisions and Modifications to and Superseding of Existing Drawings. Existing drawings, defined as those final drawings whose final copies are held by the Planning Yard, can be affected by design developed for SHIPALTs. All changes to existing drawings shall be in accordance with DOD-STD-100. The following criteria shall be utilized to determine the level of change required:

- a. **Drawing Revisions**. A revision of an existing drawing is authorized if all of the following conditions are met:
 - 1. The Master File Drawing (or 'as issued' electronic file) is held by the Planning Yard and reproduction quality is acceptable.
 - 2. Less than 25% of the existing drawing is affected.
 - 3. The revision will clearly show changes caused by the SHIPALT without loss of essential information that describes ships which have not completed the SHIPALT or are not applicable to the SHIPALT. (Use of cross-hatching over original information shall not be permitted unless the information is only applicable to one ship. Except for corrections, erasing or removal of original information shall not be permitted.)

- b. **Modification Drawing.** A modification drawing, defined as a drawing that, by modification of an existing drawing, defines the total change required for accomplishment of the SHIPALT. Preparation of a modification drawing is authorized when both of the following conditions are met:
 - 1. The Master File Drawing is not available or a revision of the existing drawing would cause confusion.
 - 2. Less than 25% of the existing drawing is affected.
- c. **Superseding Drawing.** A superseding drawing, defined as a drawing that takes the place of and cancels an existing drawing, is authorized when more than 25% of an existing drawing is changed by a SHIPALT. The superseded drawing shall have a supersedure note added and shall be retained by the Planning Yard.

3.4.17 General Notes. Each drawing shall have general notes to explain its purpose and provide general information on procedures and methods of installation (not local process instructions), welding criteria, surface preparation and painting, etc. These notes are also used to provide cautionary and safety information and to bring attention to special controls or requirements imposed on the drawing or the work to be accomplished by the drawing. All notes shall be clear, concise and complete sentences. The notes provided herein shall apply to all drawings developed in accordance with this specification. Other notes which may be required shall be as specified by NAVSEA 0902-018-2010, NAVSEA SA9AA0-AB-GOS-010, or other documentation invoked by the contract or tasking documentation, or by the Planning Yard as determined during development of the drawing.

3.4.17.1 The first general note on all BACDs shall read as follows:

"(1) THIS IS A BASIC ALTERATION CLASS DRAWING FOR ACCOMPLISHMENT OF SHIPALT __ REV __. IT WAS PREPARED BASED ON A SHIPCHECK OF USS (Ship Name and Hull Number). AN APPLICABILITY SHIPCHECK (IS/IS NOT) REQUIRED PRIOR TO ITS USE ON OTHER SHIPS"

3.4.17.2 The first general note on all SADs shall read as follows:

"(1) THIS IS A SUPPLEMENTAL ALTERATION DRAWING FOR ACCOMPLISHMENT OF SHIPALT__ REV__. IT WAS PREPARED BASED ON A SHIPCHECK OF USS (Ship Name and Hull Number). THIS DRAWING MODIFIES/REPLACES REF (Parent BACD) FOR (Hull Number(s)) ONLY FOR ACCOMPLISHMENT OF THIS SHIPALT. AN APPLICABILITY SHIPCHECK (IS/IS NOT) REQUIRED PRIOR TO ITS USE ON OTHER SHIPS."

3.4.17.3 The first general note on all Expanded Planning Yard SHIPALT drawings shall read as follows:

"(1) THIS DRAWING WAS DEVELOPED FOR ACCOMPLISHMENT OF SHIPALT(S) __ REV__. BASED ON A SHIPCHECK OF THE USS (Ship Name and Hull Number). AN APPLICABILITY SHIPCHECK (IS/IS NOT) REQUIRED PRIOR TO ITS USE ON OTHER SHIPS."

3.4.17.4 The second general note on all drawings shall read as follows:

"(2) THIS DRAWING IS BASED UPON THE REQUIREMENTS OF (NAVSEA 0902-018-2010 or S9AA0-AB-GOS-010 or other specification as applicable and provide effective date or revisions as appropriate) WHOSE PROVISIONS SHALL PREVAIL IN AREAS WHERE THIS DRAWING IS SILENT."

3.4.17.5 The third general note on all drawings shall read as follows:

"(3) EXCEPT WHERE OTHERWISE NOTED OR APPROVED BY NAVSEA, THE EFFECTIVE DATE OF FEDERAL OR MILITARY SPECIFICATIONS, PUBLICATIONS AND STANDARD/TYPE DRAWINGS AND REVISIONS AND CHANGES THERETO SHALL BE THE EFFECTIVE DATE OF (NAVSEA 0902-018-2010 or S9AA0-AB-GOS-010). LATER SPECIFICATION REVISIONS MAY BE USED PROVIDED THAT THEY MEET THE INTENT AND INTERFACE REQUIREMENTS OF THE SPECIFICATION INVOKED FOR THE SPECIFIC AVAILABILITY."

3.4.17.6 If the engineering data required by 3.5.10.7 are not an integral part of the drawing, the fourth general note on all drawings shall read as follows:

"(4) ENGINEERING DATA SUPPORTING THIS DRAWING IS FOUND ON REF__." (The drawing which contains the supporting data shall be the corresponding reference listed in the List of References.)

3.4.18 Test Notes. Test notes are to be placed on all drawings which install or alter structure, systems or equipment that require testing. The notes shall specify the type of test to be performed and the test criteria to be used. Test notes shall be separated from the general notes.

3.4.19 Modification/Supersedure Notes. All SHIPALT drawings shall contain a modification/supersedure note which states whether or not a drawing is being modified or superseded. One of the following notes shall be conspicuously placed to the left of the title block:

- a. *"THIS DRAWING MODIFIES REF __ FOR APPLICABLE SHIPS UPON ACCOMPLISHMENT OF SHIPALT__ REV__"*
- b. *"THIS DRAWING SUPERSEDES AND CANCELS REF __ FOR APPLICABLE SHIPS UPON ACCOMPLISHMENT OF SHIPALT__ REV__."*
- c. *"THIS DRAWING MODIFIES NO KNOWN DRAWING. "*

3.4.20 Drawing Submittal and Approval. SHIPALT drawings not developed by the cognizant Planning Yard will be submitted to the Planning Yard for review and approval prior to execution.

3.4.20.1 Submittal of Drawings for NAVSEA Approval. Drawings requiring approval by NAVSEA will be specified by the SHIPALT(s) designated in the contract or tasking documentation. Prints of the proposed final drawings shall be marked PRELIMINARY and submitted to NAVSEA for review and approval. (If there are drawing original tracings, they shall remain in the custody of the Planning Yard and shall not be forwarded to NAVSEA.) Two drawings prints shall be submitted to the designated NAVSEA Ship's Logistic Manager (SLM). Drawing submitted for approval shall be accompanied by a transmittal document identifying the drawings submitted, applicable SHIPALT(s), and the applicable contract or task number.

3.4.20.1.1 Proposed Departure(s) From Specifications. The Planning Yard shall request approval of any proposed departure(s) from specifications, contracts or tasking documentation as soon as possible. When the request is made concurrent with drawing submittal, it shall be accomplished by calling specific attention to the proposed departure(s) in the transmittal letter. In either case, the request for proposed departure(s) shall be submitted in accordance with

NAVSEA 0902-018-2010 or NAVSEA S9AA0-AB-GOS-010. Approved departure(s) shall be listed on the drawing(s).

3.4.20.1.2 Resubmittal of Drawings. When drawings are disapproved, the reviewer may require resubmittal of the corrected drawings

3.4.20.1.3 Previously-approved Drawings. Drawings previously approved by NAVSEA will not require further NAVSEA approval unless revisions which change technical design details are made to the drawing (revisions which add ship applicability or correct reference listing, stock numbers, etc., and do not change technical design details will not require further NAVSEA approval).

3.4.20.1.4 Review and Comment. Where the applicable SHIPALTs do not specify the need for specific NAVSEA drawing approval as indicated in Section 4, NAVSEA may desire to review the Planning Yard's effort and may elect to comment thereon. The Planning Yard's authority to proceed will not be made contingent upon such review. Any comment made as a result of the review shall not be construed as indicating approval (or disapproval). Such comments will be limited to directing attention to possible departures from specified requirements. In most cases, a formal reply or notification of actions taken by the Planning Yard will not be required, except for reviews conducted in accordance with Section 4.

3.4.21 Drawing Distribution. Except for the general distribution of drawings made by the Naval Engineering Drawing Support Activity, the distribution of SHIPALT drawings shall only be made by and shall be controlled by the cognizant Planning Yard as directed by the contract or tasking documentation. Except as otherwise specified in the contract or tasking documentation, the type of drawing copy distributed shall be as follows:

3.5 Content and Format. Content and format of NAVSEA drawings shall be as specified herein.

3.5.1 General.

3.5.1.1 Product Drawings. All NAVSEA drawings shall be prepared as product drawings and associated lists as defined by MIL-DTL-31000 except as specified herein and in contract or tasking documentation.

3.5.1.2 New drawing number. When preparing a drawing, if a major portion is developed by reproducing an existing drawing, upgrading to this specification is not required. However, a new NAVSEA drawing number shall be assigned and a new title block (see 3.4.3) shall be applied. All new and revised drawings shall be processed to achieve the requirement of Master File Drawings (see 3.4.14.2).

3.5.1.3 Separate views and notes. Where drawings are specifically applicable to more than one ship, separate views and notes shall be utilized to reflect minor differences. Views and notes which are associated with a specific ship (or ships) shall be clearly identified as such and grouped together on the drawing(s) insofar as possible.

3.5.2 Level of Detail. The installation design shall be final, complete and accurate to allow installing activities to accomplish the industrial work involved without additional design work. Drawings shall be as self-sufficient as practicable; for example, to the maximum extent possible they shall include rather than reference information given on reference drawings (other than SHIPALT drawings for that SHIPALT and Standard or Type drawings).

3.5.3 Drawing Types. As specified in the contract or tasking documentation, final drawing shall consist of the following types of drawings, as applicable, and shall meet all requirements of this specification:

- a. Hull/Structural drawings (see 3.5.6)
- b. Machinery, piping and heating, ventilation and air conditioning (HVAC) drawings (see 3.5.7)
- c. Electrical/electronic drawings (see 3.5.8)
- d. Arrangement drawings (see 3.5.9)
- e. Removal drawings (see 3.5.10)
- f. Support drawings (see 3.5.11)

3.5.4 Data Elements. As specified in the contract or tasking documentation, final drawings (see 3.4.15.2) shall contain the following data elements, formatted as specified herein:

3.5.4.1 Title Block (Front Sheet). Front sheet title blocks shall be in accordance with 3.4.3 and as follows:

- a. Show drawing titles in the following form:
SHIPALT DESIGNATION(S)
AND APPLICABLE SHIP
CLASS (OR INDIVIDUAL SHIP): (SHIPALT SSN1561 - SSN 637 CL)
SYSTEM DESIGNATION: (60HZ AC POWER DISTR)
TYPE OF DRAWING: (MOD TO WIRING DECK PLAN)
- b. An abbreviated title (not to exceed 28 characters, including spaces) shall be entered in the series of blocks between the title and the drawing identification blocks. (The SHIPALT and ship identification may be omitted from the abbreviated title.)
- c. The drawing sheet size (see 3.4.2) shall be entered in the drawing identification block marked *SIZE*.
- d. In accordance with NAVSEAINST 9085.2, the Commercial and Government Entity (CAGE) code CAGE number 53711 shall be placed in the drawing identification block marked *CAGE NO.* on all NAVSEA drawings.
- e. The weight group number (located in S9040-AA-IDX-010/SWBS5D) applicable to the drawing shall be placed in the drawing identification block marked *WT GRP*. (The weight group system chosen shall be the same as originally used on the new construction drawings for the applicable class of ships.)
- f. Each NAVSEA drawing shall have a unique drawing number assigned in accordance with NAVSEAINST 9085.2. This unique number shall be placed in the drawing identification block marked *NAVSEA DWG NO.*
- g. The latest revision of the drawing shall be indicated in the drawing identification block marked *REV*. The initial drawing issue shall be indicated as revision "-" and

the first change to the drawing shall be revision "A". Subsequent revisions shall be indicated as revisions "B", "C", "D", etc., in alphabetic sequence. Numeric ("1", "2", etc.) Or alphanumeric ("A1", "4B", etc.) designators shall not be used for revisions of NAVSEA drawings.

- h. The scale of the drawing (not just of the first sheet) shall be indicated in the block marked *SCALE*. On drawings where more than one scale is used, the block shall indicate *AS SHOWN*. On drawings which are not to any particular scale, the block shall indicate *NONE*.
- i. The block marked "SHEET 1 OF" shall indicate the total number of sheets in the drawing ("SHEET 1 OF 5" for a five sheet drawing).
- j. The identification and signature blocks to the left of the main title area and above the *ACCEPTED FOR NAVSEA* block are for use by the Naval activity assigned the responsibility for the drawing, normally the Planning Yard. The complete name, address and CAGE number (from DOD Handbook H4-1/H4-2) of the activity responsible for the drawing shall be placed in the area above the signature/date blocks. The preparer (CAD operator), the drawing checker, the cognizant engineer and the approving official shall sign and date the appropriate blocks below the activity name and address. Per 3.4.15, the electronic files shall include the typed name and '/s/' to show who signed the drawing. (The Signature Blocks may be modified to include Code and Phone Number if desired.) These blocks shall be filled in on all NAVSEA drawings which are ready for issue even when the drawing is prepared by another activity (except the *PREPARED* block which shall be lined out or filled in with the preparing activity name).
- k. For those drawings prepared by activities other than the Planning Yard, an appropriate Planning Yard official shall sign and date *the ACCEPTED FOR NAVSEA* block after review and approval of the drawing by the Planning Yard (or other activity responsible for the drawing). (If the drawing is prepared by the Planning Yard, this block may be crossed out, corner to corner.)
- l. For those drawings which are required to be approved by NAVSEA, the document which provides specific NAVSEA approval of the drawing shall be referenced in the *APPROVED BY NAVSEA* block. (No actual signature shall be placed in this block.) For those drawings not requiring NAVSEA approval, *NOT REQUIRED* shall be entered in this block.
- m. The identification and signature blocks to the left of the Naval activity block and above the *AUTHORITY* block (above the Naval activity block on "A" size formats) are for the use of the activity actually preparing the drawing if other than the Planning Yard (or other activity responsible for the drawing). The complete name, address and CAGE number (from DOD handbook H4-1/H4-2) of the non-Planning Yard activity preparing the drawing (and contract number, if applicable) shall be placed in the area above the signature/date blocks. The preparer (CAD operator), the drawing checker, the cognizant engineer and the approving official shall sign and date the appropriate blocks below the activity name and address. (If the Planning Yard prepares the drawing, this block may be crossed out, corner to corner.)
- n. The *AUTHORITY* block below the non-Planning Yard signature block (to the right of the block on "A" size formats) is to provide reference to the documentation which authorized preparation of the drawing (not the SHIPALT number).

3.5.4.2 Title Block (Continuation Sheet). Continuation sheet title blocks shall be in accordance with 3.4.3 and shall contain the same drawing identification, revision, scale and sheet number data as that required for the Front Sheet (see 3.5.4.1) except as follows:

- a. The revision letter indicated in the REV block shall be the latest revision of that sheet. The revision letter shall only be changed when that sheet is revised.
- b. The scale of the information shown on that sheet shall be indicated in the *SCALE* block. On sheets where more than one scale is used, the block shall indicate *AS SHOWN*. On sheets which are not to any particular scale, the block shall indicate *NONE*.
- c. The block marked *SHEET* shall contain the specific sheet number of that sheet ("2", "3", "4", etc.) and shall not refer to the total number of sheets in the drawing (SHEET "2 OF 4", etc.)

3.5.4.3 Revision Block. Revision blocks shall be in accordance with 3.4.3 and shall contain a complete description of the revision as follows:

- a. The *REV* column shall contain the letter designation of the revision. (The initial drawing issue, revision "-" of the drawing, shall have no information in the revision block.) The first change to the drawing, revision "A", shall begin at the top of the revision block and shall proceed down the block (when the bottom of the block is reached the revision block shall be continued (using the same dimensions) on a continuation sheet. Subsequent revisions shall be indicated as revisions "B", "C", "D", etc., in alphabetic sequence. Numeric ("1", "2", etc.) or alphanumeric ("A1", "4B", etc.) designators shall not be used for revisions of NAVSEA drawings.
- b. The *ZONE* or *SHEET* column shall contain reference to each zone or sheet affected by the revision. The zones or sheets affected by each of the *ADDED*, *DELETED*, *CHANGED*, etc., descriptions shall be placed opposite that description.
- c. The *DESCRIPTION* column shall contain reference to the document or action which required the revision to be made and shall provide a description of the modifications which were made to the drawing. This information shall be provided in the form of - *ADDED*, *DELETED*, *CHANGED*, etc. When the complete description of the revision has been provided, a line shall be drawn across the revision block at the end of the description, signifying the end of the revision description.
- d. The *BY* and *DATE* columns shall contain the signature of the person actually making the revision to the drawing and the date.
- e. The *APPROVED* column shall contain the signature of the Planning Yard official responsible for the system design. This signature shall be placed on the drawing only after the revision has been reviewed and is found to be acceptable.

3.5.4.4 Revision Status Block. Revision Status Blocks shall be in accordance with 3.4.3. The block will show the current revision status for each sheet (up to 100 sheets) (see Figure 13). The initial issue of the drawing shall indicate a "-" above the applicable sheet number indicating that all sheets are in their initial issue. As revisions are made to the drawing, the Revision Status Block is updated to reflect the current revision of each sheet. Because the first sheet is changed by every revision, the first sheet shall always show the current revision of the drawing and each sheet will always reflect the current revision status of that sheet.

3.5.4.5 Reference List Block. Reference list blocks shall be in accordance with 3.4.3 and shall list all sources of technical data referenced on the drawing. The references shall be numbered from the bottom up and a line shall be drawn across the block between each reference to avoid confusion. References on drawings are to provide details of manufacturing, detail procedures or methods, drawings being modified or superseded, pertinent information regarding the ship's structural or system configuration, and other information, as required, which will better enable the accomplishing activity to complete the work. (When referencing information or details shown on other drawings or documentation, consideration shall be given to including the information on the drawing being prepared rather than referencing it. Generally, if the referenced information has any options or decisions which must be made by the user, the information should be shown on the drawing rather than referenced. (Or if the referenced material is beyond the scope of what is expected as basic trade competency.) If the list of references exceeds the space available on the front sheet, the list may be continued (using the same dimensions) on a continuation sheet. If a listed reference is only applicable to a single ship or is being referenced for only one ship, the ship hull number shall be indicated in the column marked *HULL*, otherwise, this column shall be left blank. (If the reference is applicable to a series of ships, but not all of the ships the drawing is applicable to, a General Note shall be referenced and the applicable ships listed in the Note.)

3.5.4.6 Ship Applicability/Shipcheck Block. The ships which are applicable to a drawing and the revision of the drawing which provided applicability shall be listed in the appropriate columns of the ship applicability/shipcheck block (See 3.4.3). The shipcheck data shall be filled in when the actual applicability shipcheck takes place. (When the Planning Yard determines that an applicability shipcheck is not required for a specific drawing, the *SHIPCK BY and DATE* columns shall be crossed out, corner to corner, and *NOT RQD* shall be written across them.)

3.5.4.7 Dimensional Tolerance Block The dimensional tolerance block shall be in accordance with 3.4.3 and shall provide the dimensional tolerances for matching and geometric alignment of surfaces, parts and equipment. On drawings which do not require a dimensional tolerance block, this block shall be crossed out, corner to corner (or may be omitted).

3.5.4.8 Weight Control Data Block. The weight control data block shall be in accordance with 3.4.3. (Weight control data shall only be calculated on drawings with material lists or equipment lists which order material, not parts lists, or for Removal drawings.) The data shall be calculated in accordance with the instructions in NAVSEA 0902-018-2010, NAVSEA S9AA0-AB-GOS-010, or other documentation invoked in the contract or tasking documentation. The following entries shall be made for each SHIPALT reflected on the drawing:

- a. Drawing revision that the calculations support.
- b. SHIPALT number. If more than one SHIPALT is shown on the drawing, the weight calculations for each SHIPALT shall be shown on separate lines.
- c. Weight group (located in S9040-AA-IDX-010/SWBS5D). (Weight group system shall be the same as originally used on the new construction drawings for the applicable class of ships.)
- d. Weight added (in pounds, to the nearest pound). E. Weight removed (in pounds, to the nearest pound).

- e. Vertical center of Gravity (VCG) above the ship baseline (in feet, to the nearest tenth of a foot).
- f. Longitudinal Center of Gravity (LCG) from a specified reference point (longitudinal center of buoyancy, if known) (in feet, to the nearest tenth of a foot).
- g. Transverse Center of Gravity (TCG) identified with an (S) for starboard, a (P) for port or (CL) for centerline (in feet, to the nearest tenth of a foot).

For drawings which do not order material, the weight control data block shall be crossed out, corner to corner, with the statement *NOT APPLICABLE* written over it.

3.5.4.9 Verification Shipcheck Block. The verification shipcheck block shall be in accordance with 3.4.3 and shall be prepared, signed and dated by a responsible Planning Yard official when a high risk or complex SHIPALT drawing is shipchecked against an applicable ship to verify applicability and adequacy of design. In those instances where complex or critical SAD preparation is an overhaul activity responsibility, a verification shipcheck may be performed at the discretion of the overhaul activity upon notification of the cognizant NAVSEA SLM/SPM. Drawings shall only be verified when the drawing may have significant impact on an availability and the Planning Yard (or overhaul activity for locally prepared SADs) has reason to believe that the drawing or the design presented on the drawing is inadequate. (See also 3.3.1(c).) (For drawings which have not had a verification shipcheck, this block shall be omitted.)

3.5.4.10 Proofing Shipcheck Block. The proofing shipcheck block shall be in accordance with 3.4.3 and shall be prepared, signed and dated by a responsible Planning Yard official when proofing of a SHIPALT is required by a SHIPALT Record. The shipcheck is normally conducted after completion of a specified first-time SHIPALT as part of the formal proofing requirements. The formal proofing demonstrates that the SHIPALT satisfies its intended purpose and the proofing shipcheck certifies that the successful SHIPALT is accurately reflected in the SHIPALT drawings. (For drawings which do not require a proofing shipcheck, this block shall be omitted.)

3.5.4.11 List of Parts/Material/Equipment Blocks. Blocks for parts, material and equipment lists shall be in accordance with 3.4.3 and 3.5.5.

3.5.5 Parts/Material/Equipment Lists. For purposes of NAVSEA drawings, parts lists, material lists and equipment lists shall be defined as follows:

- a. **Parts List** - Parts lists (Figure 20) shall be utilized on fabrication drawings only and shall list all items required to fabricate one assembly. They shall be utilized for ordering material but shall not be utilized for calculation of weight and moment changes.
- b. **Material List** - Material lists (Figure 21) shall be utilized on all drawings (except those listed in 3.5.5(a) and 3.5.5(c)) which order material. They shall list all material, equipment and assemblies required for one ship. Where assemblies are utilized, the assembly part and the fabrication drawing shall be listed as the material specification. Material lists shall be utilized for ordering material and for calculating weight and moment changes.

- c. **Equipment List** - Equipment lists (Figure 22) shall be utilized on arrangement drawings and machinery drawings and shall only list components except spares, support equipment, etc. (See 3.5.5.3).

3.5.5.1 Additional drawings. In order to prevent possible loss of information, parts, material and equipment lists shall be integrated into applicable drawings (see 3.5.5(a), 3.5.5(b) and 3.5.5(c)) to the maximum extent possible. If a material, parts or equipment list is too voluminous to be accommodated on a drawing, it may be prepared separately as a size "D", or "F" drawing provided that:

- a. The list is in the form of a separate drawing and is assigned a unique NAVSEA drawing number.
- b. A statement *SEE SEPARATE LIST OF MATERIAL/PARTS/EQUIPMENT, REF. _____*, shall be placed on the drawing in the space on the title sheet normally reserved for the material, parts or equipment list.
- c. The separate list is clearly identified by cross-referencing back to the parent drawing.

3.5.5.2 Required information. Parts and material lists (3.5.5(a) and (b)) shall contain all material required to accomplish the work shown on the drawing. The following information, as a minimum, shall be provided (other required data shall be as specified in 3.5.6 through 3.5.11.)

- a. **Item number.** Item numbers are assigned sequentially to each of the different items in the list, excluding electrical cables.
- b. **Quantity required.** The total quantity of each item for one ship shall be entered in the Quantity Required column. An effort shall be made to specify exact quantities, but in those where they cannot be derived, approximations shall be made and specified as such. Use of phrases such as '*as required*' shall not be used except for items such as cable clamps, paint, etc. If incidental items are covered by other drawings, those other drawings shall be referenced.
- c. **Description.** A complete description (noun name and size) as described in the material specification (as applicable) shall be provided. For items such as structural shapes, the overall dimensions (width and height) shall be provided and shall be referenced to detail sketches on the drawing or shall be assigned assembly numbers and referenced to an assembly or detail drawing in the Part Number Column.
- d. **Material Specification.** The applicable military or other approved specification for each item of material being ordered by the drawing shall be entered in this column. Do not list the specification revision letter or date unless only a specific revision is applicable. Do not indicate an item in this column as being *COMMERCIAL* or identify an item by a proprietary or commercial name or trademark unless it is found that no standard specification is available. In such cases, the *REMARKS* column may be used to indicate *SIMILAR OR EQUAL TO _____*.
- e. **Material Requirements.** Applicable type, grade, class, condition or other classification, as applicable, is shown in this column when a specification or standard is referenced and the specification lists alternate choices. If necessary to fully describe the material required, the *REMARKS* column shall provide the additional data or a General Note shall be referenced which shall provide such information.

- f. **National Stock Number or Manufacturer's Part Number.** Unless otherwise directed by NAVSEA, the National Stock Number (NSN) or manufacturer's part number for each item shall be entered into this column. Maximum effort shall be exerted to utilize standard stock items and to minimize or preclude the use of one-of-a-kind or unsupportable items.
- g. **Source.** The source of material ordered by the drawing shall be indicated as follows:
 - 1. **Existing Material.** When the parts or material list contains existing, relocated and/or modified items, identify each of these items by the use of one of the following symbols:
 - E - Existing item (not relocated)
 - R - Existing item relocated
 - M - Existing item modified (not relocated)
 - MR - Existing item modified and relocated
 - 2. **New Material.** Identify all new items in the parts or material list by use of the following symbols:
 - GFM - Government Furnished Material (provided as part of the SHIPALT)
 - IAF - Installing Activity Furnished (not long lead time)
 - CP - Centrally Procured (not long lead time)
 - LLTM(CP) - Centrally Procured Long Lead Time Material
 - LLTM(IAF) - Installing Activity Furnished Long Lead Time Material
 - 3. The source of all material required by the drawing (e.g. "2GFM" for two items, both Government Furnished Material, or "2R/IIAF" for three items, two relocated and one installing activity furnished, etc.) shall be accounted for. The total material in the SOURCE column must equal the total in the QUANTITY column.
- h. **Allowance Parts List.** (INCREASE COLUMN WIDTH) The Allowance Parts List (APL) number for each item, as applicable, shall be provided in this column when a standard APL is available. Where no standard APL exists or the APL is to be prepared during the ship's availability, this requirement shall be omitted and the column space left blank for each applicable item.
- i. **Unit Weight.** The operating weight, including required fluids (oil, water, etc.) (not ordering weight) in pounds for one item shall be provided. (For those items ordering in running feet, square feet, gallons, etc., the weight of one unit of measure shall be provided.)
- j. **Remarks.** Any clarifying statements shall be entered in this column.
- k. For multi-SHIPALT drawings (Integrated Designs), a column titled *SHIPALT* shall be added to the left of the Part Number column. This column shall indicate the authority responsible for the purchase of each item of new material in the List of Material. (Exception: Drawings utilizing many piece-parts common to more than one SHIPALT where separate identification of quantities is impractical (e.g., foundation drawings), may specify the quantities for the group of SHIPALTs.)

3.5.5.3 Equipment lists. Equipment lists (3.5.5(c)) shall contain all equipment in the compartment, space or area depicted on the arrangement drawing. The following information, as a minimum, shall be provided:

- a. **Item Number.** Item numbers are assigned sequentially, to each of the different equipment in the list.

- b. **Quantity.** The total quantity of each equipment shown on the drawing shall be entered.
- c. **Description.** A complete description of the item shall be provided (noun name and type designation, e.g., R-1051/URR HF RECEIVER).
- d. **Source.** The source of each item shown on the drawing shall be indicated in the three *SOURCE* columns, N (New), R (Relocated) and E (Existing), as appropriate. The appropriate quantity shall be entered into the applicable column for each equipment (columns which are not applicable to a specific item shall be left blank: do not enter a quantity of "0").
- e. **Ordered on reference.** The drawing(s) which order(s) the equipment shall be referenced. For spares, support equipment (fire extinguishers, furniture, etc.) and other miscellaneous equipment which may be ordered by the arrangement drawing, a General Note shall be referenced which states, *EQUIPMENT REFERENCED TO THIS NOTE IS ORDERED BY THIS DRAWING*.
- f. **Foundation shown on reference.** The drawing which provides the equipment's foundation shall be referenced. (For equipment not requiring foundations, "N/A" shall be entered in this column.)
- g. **Allowance Parts List.** The Allowance Parts List (APL) number for each item, as applicable, shall be provided in this column when a standard APL is available. When no standard APL exists or the APL is to be prepared during the ship's availability, this requirement shall be omitted and the column space left blank for each applicable item.
- h. **Unit Weight.** The installed operating weight (not ordering weight) in pounds for one item shall be provided. (For those items ordering in running feet, square feet, gallons, etc., the weight of one unit of measure shall be provided.) (This shall only apply to items, not ordered on another drawing (spares, support equipment, etc.).)
- i. **Heat dissipation.** The heat dissipation of one unit, in watts, shall be entered. (For those items not dissipating heat, a "O" shall be entered in this column.)
- j. **Remarks.** Any clarifying statements shall be entered in the Remarks column. For equipment being ordered by the arrangement drawing, the Remarks column shall provide ordering information (part/identification number, source etc.) or shall reference General Notes which shall provide such information.

3.5.6 **Hull/Structural Drawings.** Hull/structural drawings consist of structural, foundation, penetration, arrangement (outfitting), welding, painting, hull and compartment insulation, deck covering, stowage, inspection and weld documentation drawings. They shall provide for fabrication, installation, modification, or removal of such things as hull, deck and superstructure components, compartment arrangements, painting, accesses, ladders and stairs, rigging, fittings, equipment foundations, label plates, access cuts, masts, etc.

3.5.6.1 **Symbols.** Symbols used on hull/structural drawings shall be as follows:

- a. MIL-STD-25 provides structural symbols for use on ship drawings and is to be used to assure uniformity in the preparation of structural drawings.
- b. MIL-STD-22 provides symbols to be used for welded joint design.

- c. ANSI/AWS A2.4 provides symbols for welding and non-destructive testing. (In case of conflict between ANSI/ASW A2.4 and MIL-STD-22, MIL-STD-22 shall take precedence.)

3.5.6.2 List of Material. Lists of Material on all hull/structural design drawings ordering material shall provide the following data:

- a. All material required to accomplish the task shown on the drawing shall be identified by Item Number, Quantity Required, Description, Material Specification, Material Requirements, Stock or Part Number, Source and APL number (see 3.5.5.2).
- b. If split piece bubbles are used, the following information shall also be required:
 - 1. **Last Number Used.** Enter the total number of pieces to be cut from the Quantity Required (applies to sheets, plates and lengths of steel, aluminum, etc.).
 - 2. **Sizes Required.** Enter the total number of different sizes to be cut from the Quantity Required (applies to sheets, plates and lengths of steel, aluminum, etc.).

3.5.6.3 General Content. Hull/structural drawings shall be sufficiently detailed so that no decisions affecting the features or testing of the completed installation are required by production personnel. All construction dimensions and test requirements shall be controlled by realistic tolerances consistent with function and original ship fabrication and installation design tolerances. Foundation drawing requirements are as follows:

- a. Machinery equipment foundation. Complete details of foundations are required for all machinery equipment weighing fifty pounds or more. For machinery equipment weighing less than fifty pounds, complete foundation/mounting details are required if the foundation is fabricated or if the mounting requirements are critical, unusual or complex. The location of machinery foundations shall be referenced to the applicable machinery arrangement drawing which shall provide specific mounting dimensions for the foundations.
- b. Electrical/Electronic equipment foundations. Complete details of fabrications, mounting plates, racks, etc., are required for all electrical/electronic equipment. Complete locating dimensions/requirements shall be provided on the foundation drawing to enable shop fabrication and installation of foundations, plates, racks, etc., without referring to arrangement drawings. The outline of the equipment to be supported by the foundation, plate etc., shall be shown in phantom line if it does not confuse detail.

3.5.7 Machinery, Piping and Heating, Ventilation and Air Conditioning (HVAC) Drawings. Machinery, (including all deck machinery) piping and HVAC drawings include piping, ventilation, , air conditioning and machinery arrangements, diagrams and manufacturing drawings for associated parts and assemblies. They shall provide for the installation, modification and removal of machinery, piping, hull and compartment insulation, and HVAC systems and associated equipment. Fluid power diagrams shall generally be in accordance with ANSI Y14.17. Other machinery, piping and HVAC drawings shall be in accordance with NAVSEA 0902-018-2010, NAVSEA S9AA0-AB-GOS-010 or other direction provided in the contract or tasking documentation.

3.5.7.1 Symbols.

- a. Pipe fitting, valve and piping graphic symbols for diagrammatic drawings shall be in accordance with NAVSEA Drawing No. 803-5001049, except fluid power systems, which shall be in accordance with ANSI/ASME Y32.10. A symbol legend shall be included for all fitting, valve and piping symbols used on the diagram.
- b. Welding graphic symbols shall be in accordance with MIL-STD-22 and ANSI/ AWS A2.4. In case of conflict between these specifications, MIL-STD-22 shall take precedence.
- c. Heating, ventilation and air conditioning graphic symbols for diagrammatic drawings shall be in accordance with ANSI Y32.2.4. A symbol legend shall be included for all symbols used on the drawing.

3.5.7.2 List of Material. List of material on piping drawings shall have material grouped by piping, valves and fittings, sequenced in that order, from the top of the list of material down. Each pipe size (for submarines - each pipe run) and each valve size shall be listed as a separate line item. Fittings shall be listed by type. Other lists for instruments, tanks, and hoses and flexible fittings, etc., may also be required and shall be kept on separate lists on submarine drawings, but may be placed in any sequence after the fittings list. (On surface ship drawings, these items may be included on the fittings list.) Machinery and HVAC drawings shall have one list of material. Lists of material on all machinery, piping and HVAC drawings ordering material shall provide the following data:

- a. All material required to accomplish the task shown on the drawing shall also be identified by Item Number, Quantity Required, Description, Specification, Material Requirements, Stock or Part Number, Source and APL Number (see 3.5.5.2).
- b. In addition, the following information shall also be required:
 1. **Classification.** All piping, machinery and pressure vessels shall be classified according to application in accordance with NAVSEA Pub S9074-AQ-GIB-010/278 and NAVSEA 0900-LP-001-7000.
 2. **Casting Category.** All castings which are to be used with piping, machinery and pressure vessels shall be categorized according to application in accordance with NAVSEA Pub S9074-AQ-GIB-010/278.
 3. **Material Identification and Control.** Piping system components, as applicable, shall be classified for Material Identification and Control (MIC) level in accordance with NAVSEA 0948-LP-045-7010. Any drawing which has Level I piping material indicated in the List(s) of Material shall so note above the Weight Control Data block (or title block of "A" size drawings) and shall have the following General Note added:
ITEMS (list Item numbers) SHALL COMPLY WITH LEVEL I MATERIAL IDENTIFICATION AND CONTROL MARKINGS, INSPECTION, MATERIAL TESTING, PROCUREMENT AND DOCUMENTATION REQUIREMENTS OF NAVSEA 0948-LP-045-7010.
 4. Service (Submarine Drawings only). Piping, valves and fittings shall identify the service use of each item. Items for piping runs shall provide descriptions similar to *RETURN DRAIN LP BEARING SSTG NO. 1*. Valves shall provide descriptions similar to *LOG-117 {Lube Oil, Generator (Valve Identification)}* *DRAIN SPEED CHANGER AND SERVO MTR LOW SPEED STBD*. Fittings shall be identified to the pipes and valves that they are applied to. If the quantity

of a fitting is shown as (4), then four applications must be indicated in the service column (P7, P8, P9, P10). If a pipe run or valve uses more than one of the same fitting item, the number of occurrences shall be placed in parenthesis (a gate valve using the same type of flange on both ports would be indicated as LOG-117(2) in the Service column). All components shall be accounted for in the service column.

5. **Test Pressure (Submarine Drawings only).** The test pressure for the specific pipe run shall be indicated.

3.5.7.3 General Content. Mechanical drawings shall be sufficiently detailed so that no decisions affecting the features or testing of the completed installation are required by production personnel. All dimensions and test requirements shall be controlled by realistic tolerances consistent with the original ship fabrication and installation design tolerances. Specific requirements are as follows:

- a. **General mechanical drawings.** Completed details, dimensions and tolerances shall be provided to allow installation of all required components as well as any required manufacture and/or assembly of components. Basic test criteria for all required testing and any special cautions and/or warnings shall also be noted.
- b. **Piping drawings.** Piping installation drawings shall be either line-type diagrammatic drawings or piping arrangement drawings. When pipe runs are complex or there are space constraints, a piping arrangement drawings shall be developed. For piping drawings, piping up to and including 2 inch I.P.S. (Iron Pipe Size), piping shall be represented as a single line. Piping greater than 2 inches I.P.S. shall be drawn to scale.. In complex or restricted area piping, piping arrangement drawings shall provide details of pipe, valve, hanger and fitting configuration as well as key dimensions to locate pipes, components, hangers and pipe bends whose locations are critical due to pipe stress, space constraints, etc. A tolerance of plus or minus 1/2 inch shall be applied to the dimensions unless otherwise specified and shall be so stated on the drawing.
- c. **HVAC drawings.** Except for simple duct runs in non-congested areas, duct installation drawings shall be prepared as two-line diagrammatic drawings and all complicated fittings and plenums shall be detailed on the drawings. (Simple duct runs may be represented by single lines.) Key dimensions and all critical hangers, fittings, etc. shall be detailed on the drawings.

3.5.8 Electrical/Electronic Drawings. Electrical and electronic drawings shall provide for the installation, modification and removal of electrical power and lighting distribution systems, fire control, interior communications, electronic systems such as radar, sonar, radio communications, IFF and electronic countermeasures, and control systems for various onboard machinery systems and equipment. Electrical/Electronics diagrams shall generally be in accordance with ANSI/ASME Y14.5, and ANSI Y14.15a, as applicable.

3.5.8.1 Symbols.

- a. Electrical and electronic graphic symbols for use on schematic diagrams shall be in accordance with ANSI/ASME Y32.2.

- b. Symbols for electrical and interior communications (IC) circuit diagrams shall be in accordance with currently accepted industrial practices and each drawing shall have a symbol legend identifying each symbol used on the drawing. Symbol numbers, where used with standard electrical and IC equipment, shall be in accordance with MIL-HDBK-290.

3.5.8.2 List of Material. Lists of material on all electrical and electronic drawings ordering material shall provide the following data:

- a. All material required to accomplish the task shown on the drawing shall also be identified by Item Number, Quantity, Required, Description, Specification, Material Requirements, Stock or Part number, source and APL Number (see 3.5.5.2).
- b. In addition, the following information shall also be required:
 - 1. **Symbol Number**. Where items are identified on the body of the drawing by Symbol Number, the number shall be included in the description.

3.5.8.3 General Content. Electrical/Electronic drawings shall be sufficiently detailed so that no decisions affecting the features or testing of the completed installation are required by production personnel. All dimensions and test requirements shall be controlled by realistic tolerances consistent with function and original ship fabrication and installation design tolerances. Drawings shall be in accordance with NAVSEA 0902-018-2010 and S9AA0-AB-GOS-010 as applicable.

- a. General electrical/electronic drawings. Complete details, dimensions and tolerances shall be provided to allow installation of all required components as well as any required manufacture and/or assembly of components. Basic test criteria for all required testing and any special cautions and/or warnings shall also be noted.
- b. Power and lighting system drawings. Power and lighting system drawings shall generally be prepared as line-type diagrammatic drawings. These are to be prepared as cabling diagrams, elementary wiring diagrams, wiring deck plans and power distribution diagrams as required. Isometric wiring diagrams shall not be prepared for power and lighting system drawings unless specifically required by the contract or tasking documentation. . Where cableway modifications or new cableways or penetrations are required, they shall be designed in accordance with DOD-STD-2003-5, and cableway installation drawings shall be prepared. These drawings shall be based on all known cabling changes required as the result of S/A's to be accomplished during that availability. The drawings shall identify all material requirements to accomplish the installation (i.e. stuffing tubes, multiple cable penetrators, kickpipes, hangers, etc.).
- c. Electronic and interior communication (IC) system drawings. Electronic and IC system drawings shall generally be prepared as line-type diagrammatic drawings. These are to be prepared as cabling diagrams, elementary wiring diagrams, isometric wiring diagrams and schematic diagrams, as required. Electronic and IC system drawings shall not be prepared as wiring deck plans unless specifically required by the contract or tasking documentation.

3.5.9 Arrangement Drawings. Arrangement drawings are scale drawings (usually 1/4" = 1' or

larger) of the outline of, and components within a space, area or compartment. Arrangement drawings of machinery areas shall be referred to as *MACHINERY ARRANGEMENTS*, whereas arrangements of nonmachinery areas shall be referred to as *GENERAL ARRANGEMENTS*. Arrangements of piping, wireways, penetrations, antennas, etc., shall be referred to as such (*e.g., ARRANGEMENT OF PIPING*, etc.), but may be required to be shown in a smaller scale due to large areas of the ship which may be covered by the drawing. Arrangement drawings shall include, but are not limited to, the following:

- a. **Key plan.** The key plan shows the location of the compartment, space or area and it shows the area of the ship near the affected area, usually relative to the ship's centerline and frame numbers. On drawings showing more than one deck, a separate key plan is required for each deck. (Key plans are not required on arrangements of entire deck levels.)
- b. **Bar scale.** Bar Scales are optional. If used, each sheet shall have a bar scale (graphic scale) for each scale utilized on that sheet. Bar scales shall show both vertical and horizontal dimensions.
- c. **References.** The list of references shall include references to all drawings which provide equipment/material shown in the arrangement as well as any applicable foundation drawings.
- d. **Content.** Machinery and General Arrangements shall include, but are not limited to, machinery and/or equipment in the area, space or compartment, electrical equipment, main wireways, large pipes or piping banks, ladders and stairs, bilge line, accesses and pull space for equipment maintenance, removable plates for shipping and unshipping equipment, lifting or handling gear and trolley arrangements, major structures/foundations, manholes and reserved space. Knobs, handles, piping connections, and other permanently attached protrusions shall be included in the envelope depicting all equipment as well as access, service and operator areas, shock excursions and all critical dimensions. Machinery Arrangements shall also include all required information for installation of machinery foundations.
- e. **List of equipment.** Each arrangement drawing shall have a List of Equipment in accordance with 3.5.5.3.
- f. **Weight control data.** Arrangement drawings do not generally order material except for spares, support equipment (fire extinguishers, furniture, etc.) and other miscellaneous equipment which would not be ordered by a system or structural drawing. In instances where the arrangement drawing does not order any material, the weight control block shall be crossed out, corner to corner, with the statement *NOT APPLICABLE* written over it. Arrangement drawings shall not provide weight/moment calculations for any item, component or equipment ordered on any other drawing.

3.5.10 Removal drawings. Removal drawings shall be prepared only when it is necessary to depict removal of equipment and material in the way of new installations or when removal information is too complex to be discussed in removal notes on the installation drawing. The drawing shall usually be a mark-up of the existing system or arrangement drawing showing the specific components to be removed. A *LIST OF MATERIAL TO BE REMOVED* shall be included as part of the drawing and shall include disposition instructions for all removed material. These instructions shall be one of the following:

- a. **REMOVE & SCRAP.** This notation shall be used for all material to be disposed of locally by the installing activity. (For private shipyards, this material is to be turned over to the Property Administrator designated in the contract.)
- b. **REMOVE & FORWARD.** This notation shall be used for all material not being scrapped or retained for reinstallation. This material is to be removed and forwarded for disposition. Reference to General Note providing the name and address of the activity the material is to be forwarded to shall be provided in the Remarks column if a specific activity has been designated by the cognizant material manager. If no activity has been so designated, the General Note shall read, *MATERIAL REFERENCED TO THIS NOTE SHALL BE TURNED-IN TO THE NEAREST NAVAL PROPERTY ADMINISTRATOR.*
- c. **REMOVE & RETAIN.** This notation shall be used for all material to be removed and retained by the installing activity for reinstallation. Reference to a General Note providing reference to the drawing which will reinstall the material shall be provided in the Remarks column.

3.5.10.1 Master Removal Drawing. When foundation removal information is too complex to be discussed in removal notes on the drawing, but not complex enough to warrant a complete removal drawing (see 3.5.10), a Master Removal Drawing shall be prepared. The drawing shall list the foundations affected, the name of the equipment mounted on the foundation, the compartment and the location within the compartment, foundation installation drawing (if known), and extent of removal. Equipment status shall be designated as deleted or relocated. For relocated equipment, the arrangement drawing that reinstalls the equipment shall be listed along with the new arrangement item number.

3.5.10.2 Weight Control Data. A Weight Control Data Block shall be completed in accordance with 3.5.4.8 on all Removal Drawings or any drawing providing removal information.

3.5.10.3 List of material to be removed. As discussed in 3.5.10, all Removal Drawings shall have a *LIST OF MATERIAL TO BE REMOVED*. The format shall be the same as that of a *LIST OF EQUIPMENT* (see 3.5.5.3) except that *SCRAP*, *FORWARD*, AND *RETAIN* shall be used in lieu of *NEW*, *RELOCATED* and *EXISTING* under *SOURCE*.

3.5.10.4 Support Drawings. Support drawings (sometimes referred to as *non-working* drawings) are drawings which do not order material or provide specific installation data but are used as aids in design or records of design criteria which is vital to the development and accuracy of working drawings and logistic support. These drawings are not normally forwarded to production areas, but are used by designers and planners at installing activities, by stocking and material support activities for logistic support and by Ship's Force, Planning Yards and NAVSEA to maintain configuration control. Non-working drawings include, but are not limited to the following:

3.5.10.5 Interference Control Drawings. Interference Control Drawings shall be generally prepared as arrangement drawings and reflect all work to be accomplished in a space or compartment so that any interferences will become readily apparent. These drawings are not to

be considered *working drawings* in that they do not order or install material, but like arrangement drawings are to be used as guides to prepare other drawings. Interference Control Drawings shall only be prepared when required by the number or complexity of the SHIPALTs authorized for the availability as determined by the Planning Yard.

3.5.10.6 Installation Control Drawings. Installation Control Drawings are used to specify the form, fit and function of non-standard equipment to be purchased by the installing activity or by a central procurement activity such as SPCC. These drawings also provide information required to formulate an adequate Allowance Parts List (APL). (These drawings are not to be confused with Shipboard Electronics Equipment Installation Control Drawings (sometimes referred to as "RE" Drawings) which are controlled by the Naval Engineering Drawing Support Activity, Norfolk.) Installation Control Drawings shall be prepared generally in accordance with MIL-D-23140 except as modified herein, when specifically required by the SAR.

- a. Although MIL-D-23140 is intended for electronic equipment, sections 3.4.7, 3.4.8, 3.4.9, 3.4.10, 3.4.11, and 3.4.13 of MIL-D-23140 shall be applied to machinery and electrical equipment whereas 3.4.6 through 3.4.13 of MIL-D-23140 shall be applied to electronic equipment.
- b. Sections 1 through 3.4.5 and 4 through 6.4 of MIL-D-23140 do not apply to SHIPALT Installation Control Drawings.
- c. Drawing sizes and format specified in MIL-D-23140 shall not be used. Drawing size and format shall be in accordance with paragraph 3.4 of this specification.
- d. **Weight Control Data.** Installation Control Drawings do not order material and therefore shall not be utilized for calculation of weight and moment data. The weight control data block shall be prepared in the same manner as an Arrangement Drawing which does not order material (see 3.5.9(f)).
- e. **List of Equipment.** A List of Equipment shall be prepared in accordance with 3.5.5.3. This listing shall provide information on the basic equipment and material, including technical manuals, fittings, etc. A separate listing shall detail special equipment, fitting, etc., required by the installing activity to install the equipment.

3.5.10.7 Engineering Data Drawing. The SHIPALT drawing package shall contain and describe the engineering data/rationale used in preparing the drawings. This information shall normally be included on the individual drawings. However, when the data are of significant volume or when the drawing package is of significant size, the engineering data for the SHIPALT shall be placed on an Engineering Data Drawing. (For submarines - The engineering data shall be retained on a separate Engineering Data Drawing prepared for each SHIPALT.) The drawing shall be applicable to one SHIPALT and shall include, but is not limited to, the following:

- a. Engineering considerations (such as criticality on equipment location, EMI, corrosion/coating, special non-standard access closure required, etc.).
- b. Calculations (such as those associated with heat transfer, load flow stress, sizing, electrical feeder load, stability, etc.).
- c. Requirements necessary to demonstrate satisfactory installation and performance of the SHIPALT including any necessary prerequisite testing.

3.5.10.8 Special Drawings. Special drawings may be required for a particular system or

ship type. These drawings may be invoked by NAVSEA S9AA0-AA-SPN-UI0/GEN-SPEC, NAVSEA 0902-018-2010, NAVSEA 0902-LP-041-2010 or NAVSEA S9AA0-AB-GOS-010 as invoked by the contract or tasking document. It shall be incumbent on the Planning Yard to review these documents and the applicable Ship's Drawing Index to verify that special drawings such as *List of Motors, Controllers and Master Switches, Master Instrument List, Cargo Handling Flow Diagram, Storeroom Capacity*, etc., as applicable, are updated as required when SHIPALTs are accomplished.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection. Unless otherwise specified in the tasking documentation or contract, the Planning Yard shall be responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the tasking documentation or contract, the Planning Yard may use its own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by NAVSEA. NAVSEA reserves the right to perform any of the applicable inspections set forth in the documents referenced herein, which are deemed necessary to assure engineering drawings and associated lists conform to prescribed requirements.

4.1.1 Sampling. NAVSEA will normally perform inspection of drawings on a sampling basis and will normally use the evidence of this sampling as indicating conformance or nonconformance to these specifications.

4.1.2 Planning Yard's Drawing Control System. The Planning Yard shall provide and maintain a system for the detailed examination and technical review of all engineering drawings and associated lists to be supplied under the terms of the contract or tasking documentation. The system shall assure the conformance of the engineering drawings and associated lists to all requirements specified herein. The system, including the procedures, shall be documented and shall be subject to review by NAVSEA or its designated representative. The control system is subject to the disapproval of NAVSEA or its designated representative, whenever it can be demonstrated that it fails to assure conformance to the requirements specified herein.

4.1.3 Availability of Supporting Data. The Planning Yard shall permit NAVSEA to review the supporting data normally retained by the Planning Yard in the original format that the Planning Yard used to make its design decisions, in order to aid the NAVSEA representative in the review of the Planning Yard's design.

4.1.4 Drawing Control Procedures. The Planning Yard's drawing control procedures shall cover:

- a. Assignment of responsibility for detail examination, review, and signature authority of drawings for the Planning Yard.
- b. Required qualifications of personnel performing detail examination, review, and signature authority of drawings for the Planning Yard.
- c. Procedural flow of drawings and other associated documentation.
- d. Check lists to be used in the detail examination and review of drawings. The checklists shall specify each examination to be performed to verify conformance of

drawings to the applicable requirements of this specification and the contract or tasking documentation.

- e. Method of safeguarding classified information.
- f. Methods providing for the prevention and ready detection of discrepancies and for timely and positive corrective action.
- g. Method of safe storage of Master File Drawings, reference drawings, and other ship design documentation, as well as the electronic files for these items where applicable.
- h. Methods providing for control issue of drawing copies, both reproducible and nonreproducible.

4.2 Nonconforming Data Items.

4.2.1 Format Defects (See Glossary). There may be random sampling by NAVSEA for quality of drawing format of all Planning Yard drawings as they are issued. When numerous format defects are discovered on Planning Yard drawings, the Planning Yard shall correct its process to prevent recurrence of defects found, but need not correct or redraw drawings or portions of drawings already issued unless they are illegible, do not meet the reproducibility requirements, or affect usability.

4.2.2 Engineering/Technical Defects (See Glossary). Selected drawings subordinate to each system diagram or system drawing may be reviewed by NAVSEA to determine whether they describe a system which will meet the specified requirements.

4.2.2.1 Significant Engineering/Technical Defects. When, as a result of this review, it is determined that a drawing contains significant engineering/technical defects, such defects will be identified to the Planning Yard. The Planning Yard will then review all other drawings subordinate to the next higher level of drawing (for example, system diagram or system drawing), for similar defects and then correct promptly all defects found.

4.2.2.2 Minor Engineering/Technical Defects. When, as a result of this review, it is determined that a drawing contains minor engineering/technical defects, such defects will be identified to the Planning Yard, which shall correct them.

4.2.2.3 Numerous Engineering/Technical Defects. Numerous engineering/technical defects, whether significant or minor, will be considered as an indication of poor Planning Yard quality control, and the Planning Yard shall correct its process. The Planning Yard shall advise NAVSEA of the results of its process review, including drawings examined, the number of like deficiencies found, and the steps taken to prevent recurrence.

4.3 Inspection of Preparations for Delivery. Packaging and packing of documents to be delivered under this specification shall be inspected to insure that the preparation-for-delivery requirements are met.

5. PREPARATION FOR DELIVERY

5.1 Packaging. All drawings and lists delivered under this specification shall be packaged for mailing or shipping in accordance with level A requirements of MIL-PRF-5480. Prints of size "D", "F" or "H" drawings (see 3.4.14.3) forwarded to NAVSEA, its designated representative or an installing activity, shall be folded, accordion fashion, to 8 1/2" by 11" height, with the title block completely visible.

5.1.1 Classified Material. Classified material shall be packaged in accordance with SECNAVINST 5510.36.

5.2 Packing. All drawings and lists delivered under this specification shall be packed in accordance with level C of MIL-PRF-5480.

5.3 Marking of Shipments. Identification and address markings for interior packages and shipping containers shall be in accordance with MIL-STD-129.

6. NOTES

6.1 Intended Use. Ship Alteration Drawings are intended for use by installing and support activities as well as Ship's Force and Headquarters to plan and carry out accomplishment of specific alterations to ships and ship systems, to support ships and ship systems, and to provide configuration records of work accomplished.

6.2 Ordering Data.

6.2.1 Procurement Requirements. Procurement documents should specify:

- a. Title, number and date of this specification.
- b. When Government design activity drawing numbers are to be assigned, identify the assigning activity, and if Government drawing formats are to be supplied, identify the source.
- c. The applicable Data Item Description (DID).
- d. That the metric system shall not be used.
- e. Whether company drafting standards are accepted.
- f. Kinds of associated lists required.
- g. Drawing assembly level at which associated lists will be prepared.
- h. Identify whether the mono-detail system will be used.
- i. Selection of types of engineering drawings if different than 3.4.3 of MIL-DTL-31000.
- j. Quantity and type of reproduction.
- k. Whether delivery of original drawings and undimensioned drawings are required.
- l. What special packaging of originals, when ordered, is required.
- m. Delivery schedule, and to whom the engineering drawings and supporting documents are to be delivered.

6.2.2 Data Requirements. When this specification is used in a contract procurement, the provisions of 52.277-7015 (Rights in Technical Data-Specific Acquisition) of the Department of Defense (DOD) supplement to the Federal Acquisition Regulation (FAR) shall be invoked and the data requirements identified below will be developed as specified by an approved Data Item

Description (DID) (DD Form 1664) and delivered in accordance with the approved Contract Data Requirements List (CDRL) (DD Form 1423) incorporated into the contract. Deliverable data required by this specification is cited in the following paragraphs:

Paragraph	Data Requirements	Applicable DID
3.4.15.1	Proposed Final Drawings	DI-E-7031
3.4.15.2	Final Drawings	DI-E-7031

(Copies of Data Item. Descriptions required by the contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

6.3 Definitions. For the purpose of this specification, the following definitions shall apply:

6.3.1 Allowance Parts List. A list of parts developed by the Department of the Navy for specific components which are installed on Naval Ships (Allowance Parts Lists are not yet available for all components). The parts breakdown includes all parts allowed on board and other parts stocked in the supply system.

6.3.2 Approval. The act of formally acknowledging legal responsibility by the Government (the Planning Yard (or NAVSEA if required)) for the accuracy, adequacy, and completeness of the technical data (engineering drawings and associated lists) in question to the extent/limitation specified. If the extent/limitation is not specified, it is to be assumed that the approval applies to all information disclosed.

6.3.3 Assembly. A number of parts or subassemblies or any combination thereof joined together to perform a specific function, (examples: power shovel-front, fan assembly, audio-frequency amplifier). NOTE: The distinction between an assembly and a subassembly is determine by individual application. An assembly in one instance may be a subassembly in another where it forms a portion of a larger assembly.

6.3.4 Associated list. A tabulation of pertinent engineering information pertaining to an item depicted on an engineering drawing or on a set of engineering drawings.

6.3.5 Authorize. The act of sanctioning an action (as used in this specification, the act of directing (and funding) the preparation of drawings).

6.3.6 Baseline Arrangement Drawings (submarines). A series of submarine class drawings, controlled by NAVSEA 92, which depict the approved arrangement of components in specific compartments, spaces and areas which are used by Planning Yards to develop SHIPALT arrangement drawings. Any deviation from an approved baseline drawing must be approved by NAVSEA 92.

6.3.7 Basic Alteration Class Drawings (BACDs). The first complete set of drawings prepared for a SHIPALT; they are specifically applicable to the ship for which they are prepared and generally applicable to specific follow ships of a class.

6.3.8 Bulk material. Necessary constituents of any assembly or part such as oil, wax, solder, cement, ink, damping fluid, grease, powdered graphite, flux, welding rods, thread, twine and chain from which the quantity required is not readily determinable or if knowing the quantity, the physical nature of the material is such that it is not adaptable to depiction on a drawing; or which can be cut to finished size by the use of such hand bench tools as shears, pliers, knives, etc., without any further machining operations and the configuration is such that it can be fully described in writing without the necessity of pictorial representation. In addition, high usage, low cost items and hardware generally available, such as, hinges, locks, light bulbs, fan belts, clamps, rivets, terminals, sleeving, wire, nuts, bolts, screws and washers, etc., are considered bulk materials providing such material are normally available in commercial channels and are normally procured in bulk quantities.

6.3.9 Caution. An examining or testing procedure which must be followed or risk damage to, or destruction of, equipment. Cautions shall be short, concise and used only to emphasize important or critical data. Cautions may be worded positively or negatively and shall state hazard and result or reason, unless obvious.

6.3.10 Commercial item. A term which includes both supplies and services of a class of kind which (a) regularly are used for other than Government purposes and (b) is sold or traded in the course of conducting normal business operations. NOTE: Services, per se, normally are not subject to delineation on engineering drawings.

6.3.11 Contract. All types of agreements and orders for the procurement of supplies or services.' It includes awards and notices of award; contracts of a fixed-price, cost, cost-plus-a-fixed-fee; or incentive type; contracts providing for the issuance of job orders, task orders, or task letters thereunder; letter contracts, and purchase orders. It is also includes supplemental agreements with respect to any of the foregoing.

6.3.12 Contract drawing. A NAVSEA drawing identified as a *Contract Drawing* which delineates design features of a ship. No departure from a contract drawing is permissible without specific NAVSEA approval. Contract drawings are not modified by or referenced on SHIPALT drawings.

6.3.13 Contract guidance drawing. A NAVSEA drawing identified as a *Contract Guidance Drawing* which illustrates design features of a ship. A contract guidance drawing does not necessarily depict, nor is it intended to depict, all features and details of the system and structures to which it relates. It serves the purpose of providing information which, when utilized in conjunction with applicable specification requirements, contract drawings, project-peculiar documents, and other information, may assist in detail design. Contract guidance drawings will not necessarily be updated or revised to reflect modifications. Contract guidance drawings are not modified by or referenced on SHIPALT drawings.

6.3.14 Deficiencies. Deficiencies are of two types: (1) conditions of characteristics in any hardware/software which are not in compliance with specified configuration, or (2) inadequate

(or erroneous) configuration identification which has resulted, or may result, in configuration items that do not fulfill approved operational requirements.

6.3.15 Design activity. An activity having responsibility for the design of an item. The activity may be a Government activity or a contractor, vendor or others.

6.3.16 Design agent. An activity contracted or tasked to develop details of a design for which the design activity retains responsibility.

6.3.17 Engineering data. Engineering documents such as drawings, associated lists, accompanying documents, manufacturer specifications and standards, or other information prepared by a design activity and relating to the design, manufacture, procurement, test, or inspection of items or services.

6.3.18 Engineering drawing. An engineering document that discloses (directly or by reference) by means of pictorial and/or textual presentations the physical and functional end-product requirements of an item.

6.3.19 Engineering/technical defect. Defective drawing resulting from an error in engineering judgement, or data preparation, such as misinterpretation of a technical requirement in a specification or standard, producibility, assembly, installation, test, operation, maintenance or logistic support of an item.

6.3.19.1 A significant engineering/technical defect, as used in this specification, is defined as a defect in a drawing which, if reflected in the ship or equipment when built, could cause damage in either one, or would require more than five man-days of effort to correct in the ship or equipment.

6.3.19.2 A minor engineering/technical defect, as used in this specification, is defined as a defect in a drawing which, if reflected in the ship or equipment when built, would require an effort of five mandays or less to correct in the ship or equipment.

6.3.20 In-process review. A review of drawings in the process of preparation. The contractor or the Government or both may perform the review. In-process reviews are performed primarily to assure that drawings are being prepared in accordance with contract or tasking specification requirements. In-process reviews may be conducted at the contractor's (or Planning Yard's) facility (as applicable) at any time during the development of the drawing.

6.3.21 Installation Control Drawing (ICD). A drawing that sets forth information for an item in terms of parameters such as area, mass, weight, space, access clearance, drainage, mounting, ship service requirements, cleaning, testing, clearance, and pipe, waveguide and cable attachments required for the installation and co-functioning of the installed item with related items.

6.3.22 Installing activity. A generic term applying to any activity which may be called upon to install SHIPALTs. This includes, but is not limited to Shipyards, Intermediate Maintenance Activities (IMAs) and Ship's Force.

6.3.23 Integrated Design Drawings. See Multi-SHIPALT drawings.

6.3.24 Manufacturer's drawing. A ship equipment drawing identified by manufacturer's drawing number.

6.3.25 Master file drawing. A final, approved drawing which is designed to be the permanent file drawing.

6.3.26 Modification drawing. A drawing which modifies the engineering information presented on an existing drawing. Modification drawings are generally prepared instead of revising the existing drawing when the Master File Drawing is not available or revision of the existing drawing would cause confusion. Less than 25% of the existing drawing is affected by a modification drawing. (If more than 25% of the existing drawing is affected, a new, superseding drawing shall be prepared.)

6.3.27 Multi-SHIPALT drawings. Drawings prepared to incorporate more than one SHIPALT on one set of drawings in cases where SHIPALT interfaces are complex and render separate sets of drawings to support each involved interfacing SHIPALT impractical. These may also be referred to as Integrated Design drawings.

6.3.28 NAVSEA drawing. Contractor/Government-prepared original drawings acquired or revised by or for the Naval Sea Systems Command. These drawings are assigned a NAVSEA drawing number and may be modified by or referenced on SHIPALT drawings.

6.3.29 Notes.

- a. General Notes. Notes which state conditions under which a drawing was prepared and highlighting conditions, procedures or general information necessary for complete understanding of the work to be accomplished by the drawing.
- b. Removal Notes. Notes providing information on the removal and disposition of equipment components and/or structures which must removed from a ship prior to the installation of other equipment, components and/or structures. Removal notes are normally placed after the General Notes on a drawing and sequentially numbered "R-1", "R-2", etc.
- c. Special Notes. Examining or testing procedures or conditions which should be highlighted. Special notes are included as part of general, removal or test notes which require special attention and are not normally listed separately. Special notes shall be short, concise and used only to emphasize important or critical data.
- d. Test Notes. Notes which state the testing criteria which must be met to certify the work to be accomplished by a drawing. Test notes shall not take the place of or reference specific test procedures but may invoke test criteria established by other documents such as 0902-018-2010, 0902-LP-041-2010, S9AA0-AA-SPN-101/GENSPEC or S9AA0-AB-GOS-010. Test notes are normally placed after the Removal Notes on a drawing and sequentially number "T-1", "T-2", etc. On drawings not having Removal Notes, Test Notes shall be placed after the General Notes.

6.3.30 Proofing. The process by which the Planning Yard assures the adequacy of the SHIPALT design by actual test of the hardware and the accuracy of associated drawings by actual comparison with the completed installation.

6.3.31 Review. The process wherein technical data is checked, inspected or examined for conformance to specified requirements.

6.3.32 Revision. A second or subsequent edition of a drawing or document which supersedes the proceeding edition.

6.3.33 Revision symbol. An identifying letter which may be accompanied by a suffix number and enclosed in a circle or may be the printed letter in a revision column or block.

6.3.34 Right Reading. Term to describe an image which is directly readable as opposed to a mirror image.

6.3.35 Selected record drawings (SRDs). Drawings (usually structural or system diagrams) which have been selected because they contain basic information on hull, mechanical and electrical equipment and systems. These drawings are selected for their value for operational, maintenance, training and consulting purposes to Ship's Force, fleet commands, shipyard personnel, training centers and other naval activities. The drawings designated as Selected Record Drawings are maintained current and up-to-date throughout the life of the ship. The SRDs applicable to each class of ship are listed in NAVSEA SL720-AA-MAN-010.

6.3.36 Ship construction drawings. Drawings which are necessary for construction of the ship and other related drawings as required by Section 085 of NAVSEA S9AA0-AA-SPN-010/GENSPEC.

6.3.37 SLM. Ship Logistics Manager

6.3.38 SPM. Ship Acquisition Project Manager

6.3.39 Specification, government. A government document identified as a Federal Specification (Fed. Spec.), a Department of Defense Specification (DOD Spec.), a Military Specification (Mil. Spec.) or a NAVSEA Technical Specification (NAVSEA Tech. Spec.) which describes the technical requirements for items, materials or services, including the procedures by which it will be determined that the requirements have been met.

6.3.40 Standard. A document which establishes engineering and technical limitations and applications for items, materials, processes, methods, designs and engineering practices.

6.3.41 Standard drawing. A NAVSEA drawing designated as a *Standard Drawing* delineates arrangements or details of systems, equipment or components. No departure from details of a standard drawing shall be made without the specific written approval of NAVSEA. Departures

from a referenced standard drawing on a working drawing shall be noted on that drawing and the authority for the departure shall be indicated.

6.3.42 Standard, government. A standard developed by or for a Government activity.

6.3.43 Standard, non-government. A nationally recognized standardization document issued with intent to establish common technical requirements by a non-government organization which conducts professional standardization activities and which is not organized for profit. (Does not include *COMPANY STANDARDS*).

6.3.44 Superseding drawing. A drawing which is prepared to totally replace an existing drawing.

6.3.45 Supplementary Alteration Drawings (SADs). Drawings which modify design details presented on a BACD; required to depict individual ship differences or extend applicability of BACDs to specify follow ships.

6.3.46 System (electrical - electronics). A combination of two or more sets, generally physically separated when in operation, and such other assemblies and parts necessary to perform an operational function or functions. For example: AEW electronic system, antiaircraft defense system, telephone carrier system, GCA electronic system, fire control system including the tracking radar, computer, and gun mount.

6.3.47 System (general). A combination of parts, assemblies and sets joined together to perform a specific operational function or functions. (Examples: piping system, refrigeration system, air conditioning system).

6.3.48 Technical data, limited rights. The right to use, duplicate or disclose technical data, in whole or in part, by or for the Government, with the express limitation that, without the written permission of the party furnishing the data, such technical data shall not be:

- a. Released or disclosed in whole or in part outside the Government
- b. Used in whole or in part by the Government for manufacture, or in the case of computer software documentation, for preparing the same or similar computer software, or
- c. Used by a party other than the Government, except for:
 1. Emergency repair or overhaul work only, by or for the Government, where the item or process concerned is not otherwise reasonably available to enable timely performance of the work, provided that the release or disclosure thereof outside the Government shall be made subject to a prohibition against future use, release or disclosure; or
 2. Release to foreign government, as the interest of the United States may require, only for information or evaluation within such government or for emergency repair or overhaul work by or for such government under the conditions of (1) above.

6.3.49 Technical data, unlimited rights. The right to use, duplicate or disclose technical data or

computer software in whole or in part, in any manner and for any purpose whatsoever, and to have or permit others to do so.

6.3.50 Type drawing. A NAVSEA drawing designated as a *Type Drawing* which delineates or illustrates design features of systems or components. No departure from any feature identified as *Mandatory* shall be made without the specific written approval of NAVSEA. Departures from mandatory features of a referenced type on a working drawing shall be noted on that drawing and the authority for the departure shall be indicated. The illustrative features are subject to detail design development to assure full compliance with these specifications.

6.3.51 Validation. The process by which the Planning Yard or overhaul activity assures the technical accuracy and adequacy of a drawing and that it represents the current configuration of the applicable ship by actual inspection.

6.3.52 Warning. An examining or testing procedure or practice which must be closely observed or risk either loss of life or injury to personnel. Warnings may be worded positively or negatively and shall state the hazard and result or reason. Warnings shall be short, concise and used only to emphasize specific dangers. Warnings are generally included as part of a General or Test Note, view, etc., which requires special attention and are not normally listed separately.

6.3.53 Working drawing. Those drawings which enable the following key functions to be accomplished.

- a. Order material.
- b. Plan manufacturing, fabricating, assembly operations, tooling and manufacturing facilities.
- c. Estimate the cost of material and labor.
- d. Inspect and control quality and reliability.
- e. Perform fabrication, assembly and installation.
- f. Prepare system tests.

TECHNICAL SPECIFICATION

TITLE: SHIP SELECTED RECORD DRAWINGS

NO.: TS9090-800A

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SHIPS SELECTED RECORD DRAWINGS

1. SCOPE

1.1 Introduction. This specification establishes the procedures for preparation of technically adequate Selected Record Drawings (SRDs) and consistent format and revision methodology for all active fleet ships of the U. S. Navy. This specification does not apply to Selected Record Drawings under the technical cognizance of NAVSEA 08.

2. APPLICABLE DOCUMENTS

2.1 General. The following documents of the issue in effect on the date specified in the data of the tasking correspondence form a part of this specification to the extent specified herein.

2.1.1 Government documents.

2.1.2 Specifications, standards, and handbooks. The following specifications, standards, and handbooks of the exact revision listed below form a part of this document to the extent specified herein.

SPECIFICATIONS

MIL-DTL-31000	Technical Data Packages, General Specifications for.
NAVSEA Technical Specification 9090-600	Ship Alteration Drawing Preparation, Technical Specification

STANDARDS

DOD-STD-100	Engineering Drawing Practices
MIL-STD-129	Marking for Shipment and Storage

2.1.3 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications of the exact revision level shown form a part of this document to the extent specified herein.

MANUALS

NAVSEA 0902-018-2010	General Overhaul Specifications for Deep Diving SSN/SSBN Submarines
NAVSEA SL720-AA-MAN-010	Fleet Modernization Program Management and Operations Manual

NAVSEA 0924-LP-062-0010	Submarine Safety Requirements Manual
NAVSEA S9040-AA-IDX-020/SWBS 5D	Expanded Ship Work Breakdown Structure
NAVSEA S9AAO-AA-GSO-010	General Specifications for Overhaul of Surface Ships (GSO) Including the Aegis Supplement
NAVSEA 0902-LP-041-2010	Standard Specification for U. S. Navy Craft

INSTRUCTIONS

NAVSEAINST 9085.2	Naval Sea Systems Command Engineering Drawing Management Program (EDMP): Policy and Responsibilities for
SECNAVINST 5510.36	Department of the Navy (DON), Information Security Program (ISP)
SECNAVINST 5510.30	Department of Navy Personnel Security Program
COMSCINST 9000.1	Preparation, Maintenance and Distribution of Selected Record Plans and Booklets for MSC Ships (USNS)

2.2 Precedence. In the event of conflict between the requirements of this specification and the documents referenced herein, the requirements of this specification shall apply; except that in the event of conflict between the requirements of this specification and the requirements of NAVSEA 0902-018-2010, NAVSEA 0902-LP-041-2010, or NAVSEA S9AA0-AB-GOS-010, the requirements of those documents shall apply.

3. REQUIREMENTS

3.1 General. SRDs are a group of ships drawings specifically selected for their reference value which illustrate important features, systems and arrangements applicable to an individual ship, which are maintained current throughout the life of the ship. Appendix A specifies the drawings required for each ship type.

The increasing sophistication of ships systems and equipment requires that the supporting SRDs be as clear, accurate and complete as possible. Figure I is an example of drawing detail required.

Ships Selected Record Drawings (SRDs) shall conform to the applicable documents listed and additional requirements specified herein. Within the requirements of DOD-STD-100,

MIL-DTL-31000, NAVSEA S9AA0-AB-GOS-010 (Sect 085), and the direction contained herein, Planning Yards shall provide Selected Record Drawings services as tasked.

Selected Record Data for ships operated by the Military Sealift Command shall be in accordance with COMSCINST 9000.1.

3.2 Responsibilities. The Planning Yard for each ship class is the Engineering Design Agent for SRDs. Unless otherwise directed by NAVSEA, the Planning Yard is responsible for the development, maintenance and update of SRDs.

3.3 Drawing Requirements and Guidelines.

3.3.1 General. Selected record drawings shall be prepared for each ship. Each drawing shall show the official number of that ship only. Individual NAVSEA drawing numbers shall be assigned to each drawing for each ship. Selected record drawings shall be validated to ensure they reflect the as-delivered configuration of the ship. SRDs shall be drawn to show the actual arrangement, configuration of systems, and other technical data, following a configuration validation trackwalk onboard the individual ship. (Some SRDs, such as Tank Capacity Drawings, may have to be developed from other documentation instead of trackwalked.)

SRDs shall be drawn for each specified propulsion plant system and arrangement and statements such as *Similar for Engine Room No. 2* or such an equivalent note or sketch are not acceptable.

SRDs shall be user oriented in that they provide sufficient detail and engineering support data for operational, testing, inspection, maintenance, training, and consulting purposes to individual ship's forces, fleet commands, shipyard personnel, and other activities.

3.3.1.1 Format. Physical layout shall be correct to the precision required for such a drawing; i.e., proper relationship of ships systems and equipment and include bulkhead numbers and compartment and deck identification, by name and number. The format for Title Blocks shall be in accordance with NSTS 9090-600, Sections 3.5.4.1 and 3.5.4.2 excepting drawing title information specified in Section 3.5.4.1(a). Drawing titles shall be in accordance with Appendix A of this specification.

3.3.1.2 "F" and "H" drawings. New SRDs of ships systems and arrangements shall be developed on size "F" (28" x 40") sheet(s) for most large drawings. Drawings which must be prepared as a single continuous drawing (not multiple sheets) such as some complex piping and wiring system diagrams, docking drawings, and compartment and access drawings which would exceed the length of size "F" sheets, shall be prepared as size "H" drawings. Size "H" drawings shall only be used for drawings which must display information on one continuous sheet or would be confusing if prepared as a multiple sheet drawing. Size "A" or "B" sheets may be used for intermediate size drawings, such as *Flexible Connections List*, where the data is not appropriate for, or the quantity of information does not justify size "F" sheets.

3.3.1.3 Level of detail. General guidelines for determining the level of detail required for development of SRDs shall be similar, but not limited to those indicated in example system categories listed below:

- a. **Piping.** A single-line drawing shall be used to depict the diagrammatic configuration of the system, showing valves, special fittings and components in their proper relationship. Additional features to be incorporated shall normally include the following:
1. Pipe size identification (e.g., 1 1/2", 2", 2 1/2", etc.)
 2. Component identification numbers (e.g. 1MS-V1, 1MS-F25, IMS-GA10, 1MS-TH15, etc.)
 3. Component List (See 3.3.1.4)
 4. Identification of all interface systems
 5. System flow arrows if appropriate (Not appropriate where system flow direction varies under different operating conditions.)
 6. List of Symbols
 7. List of Applicable References
- b. **Ventilation.** A single-line drawing shall be used to depict ventilation and air conditioning recirculation system showing locations of fans, heaters and cooling coils and areas served by the system. Additional features to be incorporated shall include the following:
1. Fan Data Table (with following)
 - a) Fan number and size
 2. List of Applicable References
- c. **Electrical.** A single-line diagram shall be used to depict the ships power system and shall also include enough specific data as follows:
1. **60 and 400 Hertz Power Systems.** Single-line diagram to power panels and distribution boxes with loads stubbed off.
 2. **60 and 400 Hertz Metering and Control.** Single-line diagram between switchboards and wiring diagram.
 3. Index of sheets
 4. List of Applicable References
- d. **Tank Capacity.** Curves of capacity, centers of gravity and moments of inertia for Main Ballast Tank, Bow Tank, Fuel Oil, Auxiliary, Trim, Negative, Water Around Torpedo Tubes (WRT), Hydraulic Oil, Lubricating Oil, Potable Water, Sanitary and Fresh Water shall be provided as follows for use in determining ship stability:
1. Capacity
 2. Vertical center of gravity
 3. Longitudinal center of gravity
 4. Transverse center of gravity

5. Moment of Inertia (where applicable)
 6. Residual Water including Items 1-4 inclusive (where applicable)
 7. Cavity Drain including items 1-4 inclusive (where applicable)
- e. **Naval Architecture Characteristics.** Various drawings that depict the principal static naval architectural characteristics of a submarine should include:
1. Displacement and Other Curves
 2. Lead Ballast stowage
 3. Moment Diagram
 4. Longitudinal *Flotational* Diagram
- f. **Hull/Structural.** Hull/Structural drawings shall provide such things as deck superstructure components, compartment arrangements, accesses, ladders, fittings, mast, etc. These drawings shall also include compartment/tank numbers, tank service identification, deck heights, etc.
- g. **Flexible Connections List.** Format shall be similar to Figure 3-3 of NAVSEA manual 0924-062-0010 and contain as a minimum the following:
1. Service and system in which installed
 2. Location (pipe" or equipment)
 3. Size (normal)
 4. Required replacement date
 5. Appropriate specifications
 6. Vendor model and part numbers for parts in assemblies.
- h. **Special Drawings.** Sub-Safe Certification mapping drawings, Sub-Safe Penetration drawings, Asbestos Removal drawings, Noise Review road maps, and other Special Drawings shall be as specified by NAVSEA 0902-018-2010, NAVSEA S9AA0-AB-GOS-010, or S9AA0-AA-SPN-010/GEN-SPEC, as applicable.
- i. **Arrangement Drawings.** Arrangement drawings shall be prepared in accordance with NAVSEA Technical Specification 9090-600, Section 3.5.9.

3.3.1.4 **Component List.** A Component List shall be incorporated into the applicable SRDs. This includes, functionally significant piping, valves, fittings, special fittings, instrument list, etc., as defined by NAVSEA S9040-AA-IDX-020/SWBS 5D.

- a. The format for the Component List shall include the following:
1. Piece number (ex. 1MS-V33A, 1MS-F42, 1MS-GA55)
 2. Quantity of pieces identified by quantity of one.
 3. Description of item size and noun name (ex. 5", gate valve)
 4. Expanded Ship Work Breakdown Structure (ESWBS) 5 digit number for configuration worthy items as identified in NAVSEAINST 4790. 1A.
 5. Functional description/service (1MS-33A Mn Stm COV. #1 Mn Fd Pmp)

* When authorized and invoked by the Ships Logistics Manager (SLM) or Ship Acquisition Project Manager (SHM).

3.3.1.5 General notes. SRDs shall contain a complete list of General Notes. The first general note shall read similar to the following:

"This is a Selected Record Drawing developed from conditions existing on the USS (SHIP NAME & HULL NUMBER) during shipcheck on (DATE) and includes all modifications up to and including the FY (YEAR. TYPE of Availability)."

3.3.1.6 Ship Drawing Index (SDI). Each Selected Record Drawing shall be listed in the Ships Drawing Index (SDI) under BSCI/SWAB/SWBS number "000" in addition to the applicable BSCI/SWAB/SWBS number assigned to drawing.

3.3.1.7 Shipcheck block. As each Selected Record Drawing is updated, the Shipcheck Block on the drawing above the title block shall also be updated to indicate that the drawing has been checked and corrected to show conditions actually existing on the ship.

3.3.2 Safeguarding Classified Information and Unclassified Information. SRDs and associated lists containing classified information shall be marked in accordance with SECNAVINST 5510.36 and SECNAVINST 5510.30. Further, those drawings and associated lists containing Naval Nuclear Propulsion Information, as defined in Enclosure (1) of NAVSEAINST C5511.32, shall be marked pursuant to the requirements established in NAVSEAINST C5511.32.

3.3.3 Guidelines for Updating SRDs. The following guidelines should be followed to determine the action required in the updating of SRDs.

- a. A revised drawing is authorized if the following conditions are met: The original tracing of the drawing is available and reproduction quality is acceptable. In preparing the revision, the original tracing shall be revised if alteration changes can clearly be shown without the loss of existing clarity, detail and engineering support data and the original meets the drawing requirements specified herein.
- b. A superseding drawing is required if any of the following conditions apply:
 1. The original tracing of the drawing is missing or is not available.
 2. The original tracing does not meet the drawing requirements specified herein and changes to the drawing are required to suit the subject ship. SRDs are not to be redrawn for the sole purpose of meeting the drawing requirements specified herein.
 3. Whenever the original of an SRD, because of age, extensive corrections or other reasons, deteriorates so that legible prints cannot be made, a new drawing must be prepared. When preparing new drawings for any of the above reasons and the original does not meet the drawing requirements herein, they shall be developed in accordance with these requirements and the drawings assigned a new NAVSEA drawing number.

- c. A new drawing is authorized when alterations have been accomplished that would normally require correction of SRDs as specified herein, but where these drawings have not been previously prepared, the following procedures shall be adhered to:
 1. Where only a class drawing exists, a reproducible copy is to be made provided it can be corrected to meet the drawing requirements specified herein and to reflect the specific hull configuration (Class Docking Drawings excepted per NSTM, Chapter 997 - Docking Instructions and Routine Work in Drydock (NAVSEA S9086-7G-STM-000)). This drawing shall be assigned a new NAVSEA drawing number and designated as the SRD applicable only to the subject ship.
 2. When a specific SRD does not exist or was never provided by the Planning yard or the ship, a new original drawing shall be prepared in accordance with the drawing requirements specified herein by the Planning Yard (Class Docking Drawings excepted per NSTM, Chapter 997 - Docking Instructions and Routine Work in Drydock (NAVSEA S9086-7G-STM-000)).

3.3.3.1 Inactive Ships SRD Preparation. When inactive ships are being activated for assignment to the active fleet, the SRDs are to be corrected as necessary to suit requirements specified herein.

3.3.3.2 Nuclear-Powered Ship Docking Drawing. Docking drawing for nuclear-powered ships must be prepared and/or revised in conformance with the requirements of Naval Ships Technical Manual, Chapter 997 - Docking Instructions and Routine Work in Drydock (NAVSEA S9086-7G-STM-000) and additional requirements of FMP Manual SL720-AA-MAN-010.

3.3.3.3 Reactor Plant SRD Requirements. Requirements relative to Reactor Plant Selected Record Drawings are provided in Subsection 4.13 of FMP Manual SL720-AA-MAN-010.

3.3.3.4 Submarine Rescue and Salvage Drawings. The Salvage System Arrangement and Booklet of General Drawings for submarines are designated as Rescue and Salvage Drawings. These drawings must be accurate and available at all times for use in the event of a submarine disaster. The Booklet of General Drawings is to be modified to include a compartment flooding effect tabulation and bulkhead holding depths as follows:

- a. Each main watertight compartment
- b. Floodable volume of each compartment in gallons and tons
- c. Vertical and horizontal centers of gravity for specific flooding levels for each main compartment
- d. Maximum holding depth for which the internal main division bulkheads are designed

Whenever changes affecting the Rescue and Salvage Drawings are made by a shipyard, the shipyard will furnish prints of such drawings to the Commanding Officer of the submarine concerned. The Commanding Officer will be responsible for certifying that these prints either conform to the actual arrangement, or are marked up to show differences, and then return them to the shipyard. Prior to the submarine's departure, the shipyard will furnish the Commanding Officer two reproducible copies of the corrected drawing and additional prints as requested. If an

alteration is made by Forces Afloat, the Commanding Officer of the submarine will mark up his drawing accordingly, submit the drawing to the Planning Yard for update and distribution, and notify operational commands as specified by Type Commanders. To avoid confusion in identifying revisions by alteration number, the reproducible copies of Rescue and Salvage Drawings will not be altered except by shipyards.

3.3.4 SRD Revisions.

3.3.4.1 General. Revisions to SRDs shall be made in accordance with DOD-STD-100 with particular attention to areas amplified herein.

3.3.4.2 Revision Methods. Revisions shall be made by erasure, addition of information, or by redrawing. Revisions to CAD-generated drawings shall be developed by CAD systems only.

3.3.4.3 Identifying Revisions on SRDs. Revision locations shall be identified by all of the following methods:

- a. Revision symbols on field of drawing.
- b. Description in the revision block.
- c. Zone in the zone column within the revision block.
- d. Revision authorization document referenced on drawing.

3.3.4.4 Multiple Changes. All changes to a SRD incorporated at one time shall be identified by the same revision letter. The changes shall be numbered sequentially to permit ready identification of a specific change. In this case, the appropriate sequence number will appear as a suffix to the revision letter.

3.3.4.5 Required Revisions. Any change to an SRD shall be recorded as a revision. When security classification is changed on a drawing, this will also constitute a revision to the drawing.

3.3.4.6 Recording Revision Description on SRDs. Revision description shall be written as briefly and concisely to provide sufficient detail as necessary to accurately define the change in the description column.

3.3.4.6.1 Zoning. When changes are recorded by zoning, the zone in which each change is made shall be entered in the zone column on the same line as the description of the change.

3.3.4.7 Revision Of Multi.Sheet SRDs.

3.3.4.7.1 Requirement. Concurrent changes made upon any or all sheets of a multiple-sheet drawing shall be identified on each sheet so revised by the same revision letter. Each revision affecting any or all sheets shall be identified on the revision record sheet or status of sheets block.

3.3.4.7.2 Procedure.

- a. Revision upon any sheet of the drawing shall be made and recorded in the usual manner except that the sequence of revision letters and serial suffixes shall apply to the drawings as a whole rather than to each individual sheet. Sheet 1 shall include a tabulation to indicate the revision status of each sheet comprising the group. Whenever a change is made on any sheet, the revision letter applicable to that change shall be entered in the revision status block on Sheet 1, both in the column for the revised sheet and for Sheet 1 (regardless of whether there is any other change on Sheet 1). No revision symbols are required to indicate these entries in the revision status block. For each other sheet, the last applicable revision letter shall be entered in the appropriate column of the revision status block. For all sheets that have never been revised, a dash shall be entered in the appropriate columns.
- b. In the case of computer prepared multi-sheet drawings all sheets shall be identified by the same revision letter regardless of which sheet the revision applies to.

3.3.5 Signature Responsibilities. SRDs shall have (as a minimum) the signature entries listed below in the title block region of the drawing as delineated by NAVSEA Technical Specification 9090-600. The person signing for each of the signature entries is responsible for the following functions:

- a. Drawn or Prepared by. This shall consist of the printed name of the person who prepared the drawing.
- b. Reviewed or Checked by. This shall consist of the printed name of the person who reviewed or checked the drawing and the responsible Technical Code Number.
- c. Approved by. This shall consist of the signature of the person responsible for the lead on the project in the Planning Yard Technical Code (i.e., Lead Engineer, Group Leader, or Supervisor). This person shall: (a) be responsible for properly invoking the engineering and technical requirements (i.e., MIL-STD, MIL-SPECS, etc.); (b) ensure compliance with engineering drawings standards; (c) be knowledgeable of the ships system configuration validation shipcheck and initial drawing preparation; and (d) perform the final independent review of the completed SRD for all aspects of quality (i.e., procedural, technical, engineering, and incorporation of shipcheck information).

If the SRD is prepared by a Contractor, the approval line shall be signed by the senior Navy person responsible (see (c) above) for the content of the drawings. In all cases a Navy Title Block shall be used.

3.3.5.1 Product quality. Personnel responsible for SRD preparation, reviewing or checking and approval shall utilize drawing checklists and audits, as necessary, to ensure product quality in accordance with specifications herein and established procedures for other drawings in consonance with governing requirements (e.g., NAVSEA TL855-AA-STD-010 - Shipyard Quality Program Manual).

3.3.5.2 Overall quality. In the event that SRD preparation is performed by an activity (Government or Private) other than the cognizant Planning yard, the overall quality of the SRD effort remains the responsibility of the Planning Yard.

3.3.5.3 Submarines. For submarines, the above does not relieve the overhaul shipyard of the responsibility, as set forth in NAVSEA 0902-018-2010, to:

- a. furnish the ship prior to fast cruise with one full sized print of each selected record drawing reflecting the end of overhaul configuration.
- b. provide written certification, prior to fast cruise, to the submarine commanding officer, with copies to the appropriate Type Commander and Squadron Commander and NAVSEA, that the selected record drawings affected during overhaul/conversion have been updated and reflect, as a minimum, all accomplished SHIPALTs and all changes wrought by the Ship's Force.

3.3.6 SRD Distribution. SRDs shall be distributed in accordance with NAVSEA SL720-AA-MAN-010.

4. QUALITY ASSURANCE

4.1 Responsible For Inspection. Unless otherwise specified in the tasking documentation or contract, the Planning Yard shall be responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the tasking documentation or contract, the Planning Yard may use its own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by NAVSEA. NAVSEA reserves the right to perform any of the applicable inspections set forth in the documents referenced herein, which are deemed necessary to assure engineering drawings and associated lists conform to prescribed requirements.

4.1.1 Sampling. NAVSEA will normally perform inspection of drawings on a sampling basis and will normally use the evidence of this sampling as indicating performance or nonconformance to these specifications.

4.1.2 Planning Yard's Drawing Control System. The Planning Yard shall provide and maintain a system for the detailed examination and technical review of all engineering drawings and associated lists to be supplied under the terms of the contract or tasking documentation. The system shall assure the conformance of the engineering drawings and associated lists to all requirements specified herein. The system including the procedures shall be documented and shall be subject to review by NAVSEA or its designated representative. The control system is subject to the disapproval of NAVSEA or its designated representative, whenever it can be demonstrated that it fails to assure conformance to the requirements specified herein.

4.1.2.1 Availability of Supporting Data. The Planning Yard shall permit NAVSEA to review the supporting data normally retained by the Planning Yard in the original format that the Planning Yard used to make its design decisions, in order to aid the NAVSEA representative in the review of the Planning Yard's design.

4.1.2.2 Drawing Control Procedures. The Planning Yard's drawing control procedures shall cover:

- a. Assignment of responsibility for detail examination, review, and signature authority of drawings for the Planning Yard.
- b. Required qualifications of personnel performing detail examination, review, and signature authority of drawings for the Planning Yard.
- c. Procedural flow of drawings and other associated documentation.
- d. Check lists to be used in the detail examination and review of drawings. The check lists shall specify each examination to be performed to verify conformance of drawings to the applicable requirements of this specification and the contract or tasking documentation.
- e. Method of safeguarding classified information.
- f. Methods providing for the prevention and ready detection of discrepancies and for timely and positive corrective action.
- g. Method of safe storage of Selected Record Drawings, reference drawings, and other ship design documentation.
- h. Methods providing for controlled issue of drawing copies, both reproducible and non-reproducible.

4.2 Nonconforming Data Items.

4.2.1 Format Defects. There may be random sampling by NAVSEA for quality of drawing format of all Planning Yard drawings as they are issued. When numerous format defects are discovered on Planning Yard drawings, the Planning Yard shall correct its process to prevent recurrence of defects found, but need not correct or redraw drawings or portions of drawings already issued unless they are illegible, do not meet the reproducibility requirements, or affect usability.

4.2.2 Engineering/Technical Defects. Selected drawings subordinate to each system diagram or system drawing may be reviewed by NAVSEA to determine whether they describe a system which will meet the specified requirements.

4.2.2.1 Significant Engineering/Technical Defects. When, as a result of this review, it is determined that a drawing contains significant engineering/technical defects, such defects will be identified to the Planning Yard, which shall review all other drawings subordinate to the next higher level of drawing (for example, system diagram or system drawing), for similar defects and then correct promptly all defects found.

4.2.2.2 Minor Engineering/Technical Defects. When, as a result of this review, it is determined that a drawing contains minor engineering/technical defects, such defects will be identified to the Planning Yard, which shall correct them.

4.2.2.3 Numerous Engineering/Technical Defects. Numerous engineering/technical defects, whether significant or minor, will be considered as an indication of poor Planning Yard quality control, and the Planning Yard shall correct its process. The Planning Yard shall advise NAVSEA of the results of its process review, including drawings examined, the number of like deficiencies found, and the steps taken to prevent recurrence.

4.2.3 Microfilm. Those microfilm system elements described herein which, after inspection by NAVSEA or its designated representative, are found not to be in compliance with specification requirements shall be replaced at no additional cost to the Government.

4.3 Inspection of Preparations for Delivery. Packaging and packing of documents to be delivered under this specification shall be inspected to insure that the preparation for-delivery requirements are met.

5. PREPARATION FOR DELIVERY

5.1 Packaging. All drawings and lists delivered under this specification shall be packaged for mailing or shipping in accordance with Level A requirements of MIL-PRF-5480, except that blue-line prints of size "D", "F" or "H" drawings forwarded to NAVSEA, its designated representative, or an installing activity shall be folded, accordion fashion, to 8 1/2" by 11" height, with the title block completely visible.

5.1.1 Classified Material. Classified material shall be packaged in accordance with SECNAVINST 5510.36.

5.1.2 Packing. All drawings and lists delivered under this specification shall be packed in accordance with level C of MIL-PRF-5480.

5.2 Marking of Shipments. Identification and address markings for interior packages and shipping containers shall be in accordance with MIL-STD-129.

6. NOTES

6.1 Intended Use. Ship Selected Record drawings are used to provide a record of important features, systems and arrangements applicable to an individual ship, which are maintained current throughout the life of the ship.

6.2 Ordering Data.

6.2.1 Procurement Requirements. Procurement documents should specify:

- a. Title, number and date of this specification.
- b. When Government design activity drawing numbers are to be assigned, identify the assigning activity, and if Government drawing formats are to be supplied, identify the source.
- c. The applicable Data Item Description (DID).
- d. That the metric system shall not be used.
- e. Whether company drafting standards are accepted.
- f. Kinds of associated lists required.
- g. Drawing assembly level at which associated lists will be prepared.
- h. Identify whether the mono-detail system will be used.

- i. Selection of types of engineering drawings if different from MIL-DTL-31000.
- j. Quantity and type of reproduction.
- k. Whether microfilm is required, and if so, what type is required.
- l. Whether delivery of original drawings and undimensional drawings are required.
- m. What special packaging of originals, when ordered, is required.
- n. Delivery schedule, and to whom the engineering drawings and supporting documents are to be delivered.

6.2.2 Data Requirements. When this specification is used in a contract procurement, the provisions of 52.277-7015 (Rights in Technical Data-Specific Acquisition) of the Department of Defense (DOD) supplement to the Federal Acquisition Regulation (FAR) shall be invoked and the data requirements identified below will be developed as specified by an approved Data Item Description (DID) (DD Form 1664) and delivered in accordance with the approved Contract Data Requirements List (CDRL) (DD Form 1423) incorporated into the contract. Deliverable data required by this specification is cited in the following paragraphs:

Paragraph	Data Requirement	Applicable DID
3.3	Selected Record Drawings	DI-E-7031

(Copies of Data Item Descriptions required by the contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

APPENDIX A TO NSTS 9090
SELECTED RECORD DRAWINGS FOR SHIP CLASSES

Table I
Section A
AOE-AS

Section B
CG-DDG

Section C
LCC-MHC

Table II
CV, CVN

Table III
SS, SSN, SSBN

Table IV
Other Ships

**TABLE I, SECTION A
SELECTED RECORD DRAWINGS**

(Note: For MSC operated ships, refer to COMSCINST 9000.1)

DRAWING TITLE	SHIP: CLASS:	AOE 1	AOE 6(TBD)	ARS 50	AS /39
Docking Drawings		X		X	X
Booklet of General Drawings		X		X	X
Schedules of Watertight Integrity Tests & Inspections		X		X	X
Tank Capacity and Vertical Center of Gravity Curves		X		X	X
Booklet of Tank Sounding Tables		X		X	X
Running, Signal and Anchor Lights (Location drawing) (To be included in Booklet of General Drawings.)		X		X	X
Main Steam Systems Diagrams		X			X
Auxiliary Steam System Diagram		X			X
High Pressure Steam Drain Systems Diagram		X			X
Condensate System Diagrams		X			X
Feed System Diagrams and Reserve and Makeup Feed		X			X
Main Sea Water Cooling System Diagrams		X			X
Auxiliary Sea Water Cooling System Diagrams		X			X
Steam Operated Distilling System		X			X

TABLE I-A-1

**TABLE I, SECTION A
SELECTED RECORD DRAWINGS**

DRAWING TITLE	SHIP: CLASS:	AOE 1	AOE 6	ARS 50	AS 39
Steering Gear Hydraulic Systems Diagram		X			X
High Pressure Air System Diagrams (Ind MP)		X		X	X
60HZ A.C. Power Distrn System Diagrams		X		X	X
400 HZ A.C. Power Distrn System Diagrams		X		X	X
Low Pressure Steam Drain System Diagrams		X			X
Fresh Water Drain Collecting System Diagrams		X			X
Steam Plant Control System Diagrams (Including Steam Plant Control Panel and Benchboards)		X			X
Ships Service Auxiliary Cooling Water Diagrams		X			X
Ships Service Power Sources Diagram (Including equipments such as SSTGs, SSMGs, CTG, Diesel Generators, Batteries that are not included in Power Distribution Systems above)		X			X
Main Lube Oil System Diagrams		X		X	X

TABLE I-A-2

**TABLE 1. SECTION A
SELECTED RECORD DRAWINGS**

DRAWING TITLE	SHIP: CLASS:	AOE 1	AOE 6	ARS 50	AS 39
Lube Oil Fill, Transfer and Purification System Diagrams		X		X	X
Ships Service Circulating Water System Diagrams (Those portions associated with the Propulsion Plant)		X			X
Steam Plant Salinity Indicator System Diagrams		X			X
Service and Control Air Systems Diagrams (Those portions associated with the propulsion plant)		X			X
Asbestos Removal Drawings		X			X
HVAC Diagrammatic and System Control Drawings		X			X
Ordnance Handling Drawings		X			
Fire Fighting Systems Diagrams		X			X
Electronic Cooling Water Systems Diagrams		X			X
Helo Landing and Signal Lighting System Diagrams		X			X
H.P. Auxiliary Steam System Diagrams		X			X
Auxiliary Exhaust Steam System Diagrams		X			X

TABLE I-A-3

**TABLE I, SECTION A
SELECTED RECORD DRAWINGS**

DRAWING TITLE	SHIP: CLASS:	AOE 1	AOE 6	ARS 50	AS 39
Gland Sealing Steam System Diagrams		X			X
Auxiliary Gland Leak-Off System Diagrams		X			X
Air Vent Piping System Drawings		X			X
LP Air System Diagrams		X			X
Flooding Effect and Liquid Loading		X			X
Sub-Division First Platform and Below		X			X
Sub-Division Main Deck and Above		X			X
JP-5 Filling, Transfer, and Overflow Systems		X			X
Casualty Power Supply Systems		X			X
Casualty Communications Systems		X			X
Vital DMG CTL Elect Eqpt and Power Supply Chart		X			X
Communications Directory		X			X
Potable (Propulsion Plant) Support Water Fill, Transfer Service and Purification System		X			X
Chilled Water Systems Drawings		X			X

TABLE I-A-4

**TABLE I, SECTION A
SELECTED RECORD DRAWINGS**

DRAWING TITLE	SHIP: CLASS:	AOE 1	AOE 6	ARS 50	AS 39
Main and Secondary Drainage System Drawings		X			X
Oily Water Transfer System Drawings		X			X
CIC Arrangement of Eqpt		X			X
Boiler Blow System Diagrams		X			X
Pilot House and Bridge Wing Arrangement of Eqpt		X		X	X
Computer Room Arrangement of Eqpt					X
Communications Central Arrangement of Eqpt		X		X	X
Topside Arrangement Drawings		X		X	X
Compartment and Access Drawings		X			X
Topside Ant Sys Arrangement		X			X
Deep Submergence System (DSS) Drawings (as specified in Certification Milestones)				X	
Fuel Oil Transfer Systems Diagrams		X			X
Fuel Oil Stripping System Diagrams		X			X
Fuel Oil Service System		X			X
Electrical Load Analysis		X			X

TABLE I-A-5

**TABLE I, SECTION A
SELECTED RECORD DRAWINGS**

DRAWING TITLE	SHIP: CLASS:	AOE 1	AOE 6	ARS 50	AS 39
Pumping, Drainage and Ballasting System Drawings		X			X
H.P. Air Start System Drawings (Gas Turbine and Diesel Propulsion Only)					
Dirty Oil Drain System Drawings (Gas Turbine and Diesel Propulsion Only)					
Air Inlet System Drawings (Gas Turbine and Diesel Propulsion Only)					
Air Inlet Separator System Drawings (Gas Turbine and Diesel Propulsion Only)					
Muffler System Drawings (Gas Turbine and Diesel Propulsion Only)					
ACC/FWC Systems Diagrams		X			X
Underway Replenishment Drawings (AO, AOR, AOE, AFS,AE)		X			

TABLE I A-6

**TABLE I, SECTION B
SELECTED RECORD DRAWINGS**

DRAWING TITLE	SHIP: CLASS:	CG 47	DD 963	DDG 51
Docking Drawings		X	X	X
Booklet of General Drawings		X	X	X
Schedules of Watertight Integrity Tests & Inspections (except service craft)		X	X	X
Tank Capacity and Vertical Center of Gravity Curves		X	X	X
Booklet of Tank Sounding Tables		X	X	X
Flexible Connections List		X	X	X
Running, Signal and Anchor Lights (Location drawing) (To be included in Booklet of General Drawings)		X	X	
Main Steam Systems Diagrams				
Auxiliary Steam System Diagrams				
High Pressure Steam Drain Systems Diagrams				
Condensate System Diagrams				
Feed System Diagrams and Reserve and Makeup Feed				
Main Sea Water Cooling System Diagrams		X	X	
Auxiliary Sea Water Cooling System Diagrams	X	X	X	

TABLE I-B-1

**TABLE I, SECTION B
SELECTED RECORD DRAWINGS**

DRAWING TITLE	SHIP: CLASS:	CG 47	DD 963	DDG 51
Steam Operated Distilling System		X	X	
Steering Gear Hydraulic Systems Diagrams		X	X	X
High Pressure Air System Diagrams (Incl MP)		X	X	X
60 HZ A.C. Power Distrn System Diagrams		X	X	X
400 HZ A.C. Power Distrn System Diagrams		X	X	X
Low Pressure Steam Drain System Diagrams				
Fresh Water Drain Collecting System Diagrams				
Steam Plant Control System Diagrams (Including Steam Plant Control Panel and Benchboards)				
Ships Service Auxiliary Cooling Water Diagrams				
Ships Service Power Sources Diagram (Including equipments such as SSTGs, SSMGs, CTG, Diesel Generators, Batteries that are not included in Power Distribution Systems above)		X	X	X

TABLE I-B-2

**TABLE I, SECTION B
SELECTED RECORD DRAWINGS**

DRAWING TITLE	SHIP: CLASS:	CG 47	DD 963	DDG 51
Electric Plant Temperature Monitoring System Diagrams				
Electric Plant Control System Diagrams (Including Electric Plant Control Panel and Benchboard)		X	X	X
Main Lube Oil System Diagrams		X	X	X
Lube Oil Fill, Transfer And Purification System Diagrams		X	X	X
Propulsion Plant Temperature Monitoring System Diagrams				
Propulsion Speed Indicator System Diagrams				
Steam Plant Alarm System Diagrams				
Steam Plant Salinity Indicator System Diagrams				
Air Conditioning System and Ventilation Diagrams (Those portions associated with propulsion spaces less reactor compartment)				
Steam Plant Pneumatic Control Air System Diagrams				

I-B-3

**TABLE I, SECTION B
SELECTED RECORD DRAWINGS**

DRAWING TITLE	SHIP: CLASS:	CG 47	DD 963	DDG 51
Service and Control Air Systems Diagrams (Those portions associated with the propulsion plant)				
Displacement And Other Curves				
Tank Capacity Curves, Curves of Center of Gravity, and Curves of Moments of Inertia				
Asbestos Removal Drawings		X	X	
HVAC Diagrammatic and System Control Drawings		X	X	X
Ordnance Handling Drawings		X	X	
Fire Fighting Systems Diagrams		X	X	
Electronic Cooling Water Systems Diagrams		X	X	X
Helo Landing and Signal Lighting System Diagrams		X	X	X
H.P. Auxiliary Steam System Diagrams				
Dirty Drain System Diagrams				
Auxiliary Exhaust Steam System Diagrams				
Gland Sealing Steam System Diagrams				

TABLE I-B-4

**TABLE I, SECTION B
SELECTED RECORD DRAWINGS**

DRAWING TITLE	SHIP: CLASS:	CG 47	DD 963	DDG 51
Auxiliary Gland Leak-Off System Diagrams				
Air Vent Piping System Drawings				
LP Air System Diagrams			X	X
Flooding Effect and Liquid Loading		X	X	
Sub-Division First Platform and Below		X	X	
Sub-Division Main Deck and Above		X	X	
JP-5 Filling, Transfer, and Overflow Systems		X	X	X
Casualty Power Supply Systems		X		
Casualty Communications Systems		X	X	
Vital DMG CTL Elect Eqpt and Power Supply Chart		X	X	
Communications Directory			X	
Potable (Propulsion Plant) Support Water Fill, Transfer, Service and Purification System (Mchry Space)		X	X	
Chilled Water Systems Drawings		X	X	X
Main and Secondary Drainage System Drawings			X	X

TABLE I-B-5

**TABLE I, SECTION B
SELECTED RECORD DRAWINGS**

DRAWING TITLE	SHIP: CLASS:	CG 47	DD 963	DDG 51
Oily Water Transfer System Drawings		X	X	
Auxiliary Boiler Support System Drawings		X	X	
Reboiler Systems Diagrams				
CTC Arrangement of Equipment		X	X	X
Boiler Blow Systems Diagram			X	
Pilot House and Bridge Wing Arrangement of Eqpt		X	X	X
Computer Room Arrangement of Eqpt		X	X	
Communications Central Arrangement of Eqpt		X	X	X
Topside Arrangement Drawings		X	X	
Compartment and Access Drawings		X	X	X
Topside Ant Sys Arrangement		X	X	X
Ships Service Circulating Water System Diagrams (Those portions associated with the Propulsion Plant)				
Deep Submergence System (DSS) Drawings (as specified in Certification Milestones)				
Lead Ballast Stowage Arrangement Drawings		X	X	

TABLE I-B-6

**TABLE I, SECTION B
SELECTED RECORD DRAWINGS**

DRAWING TITLE	SHIP: CLASS:	CG 47	DD 963	DDG 51
Propulsion Control System Diagrams		X	X	
Service Air System Diagrams (Those Portions Associated with the Propulsion Plant)		X	X	
150 #Auxiliary Steam System Diagrams		X	X	
Fuel Oil Transfer Systems Diagrams		X	X	
Fuel Oil Stripping System Diagrams		X	X	
Fuel Oil Service System		X	X	
Prairie/Masker Compressed Air System Drawings		X	X	
Waste Heat Hot Water Circulating System Drawings		X	X	
Electrical Load Analysis		X	X	X
Equipment Removal Route and Instructions Drawings		X	X	X
Pumping, Drainage and Ballasting System Drawings		X	X	
Auxiliary Thrust Bearing Assembly and Detail Drawings		X	X	
Bleed Air System Drawings (Gas Turbine Propulsion Only)		X	X	

TABLE I-B-7

**TABLE I, SECTION B
SELECTED RECORD DRAWINGS**

DRAWING TITLE	SHIP: CLASS:	CG 47	DD 963	DDG 51
H.P. Air Start System Drawings (Gas Turbine and Diesel Propulsion Only)		X	X	
Dirty Oil Drain System Drawing (Gas Turbine and Diesel Propulsion Only)		X	X	
Air Inlet System Drawings (Gas Turbine and Diesel Propulsion Only)		X	X	X
Air Inlet Separator System Drawings (Gas Turbine and Diesel Propulsion Only)		X	X	X
Muffler System Drawings (Gas Turbine and Diesel Propulsion Only)				
Seawater service systems (firemain, sprinkling, washdown SSGTG cooling) systems diagrams				X
Machinery Centralized Control System major function drawings				X
Door, hatch and scuttle list				X
SSGTG cooling system diagrams				X
Gas turbine mounts and measurements list				X
Potable water (propulsion plant support) and vital space protection support, fill, transfer, service and purification systems diagrams				X

	X
PRAIRIE/MASKER, bleed, anti-icing and starting air systems diagrams	
Fill connection drawing	X
Sonar dome pressurization system control panel drawings	X
Remote monitoring and control panel mimic and indicator layout drawing for fuel transfer	X
Hose list drawing	X
Centralized seawater cooling systems drawings	X
Oily waste drain collecting system diagram	X
Oily waste transfer system drawing	X
Chart Room – arrangement of equipment	X
Radio communication system block diagram	X
CSER #1 and Sonar Control Room – arrangement of equipment	X
CSER # 2 and TOMAHAWK Equipment Room – arrangement of equipment	X
CSER #3 – arrangement of equipment	X
Sea connections drawings	X
Ships fuel fill, transfer, service and compensating systems diagram	X
Panama canal drawing	X
Ships Signal Exploitation Space (SSES) – arrangement of equipment	X

Arrangement of special coating materials	X
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TABLE I-B-8

**TABLE I, SECTION C
SELECTED RECORD DRAWINGS**

DRAWING TITLE	SHIP: LCC 19	LHA	LHD 1(TBD)	LHD 8(TBD)	LPD	LPD 17(TBD)	LSD 36	LSD 41/49	MCM	MHC (TBD)	MSO
Docking Drawings	X	X			X		X	X	X		X
Booklet of General Drawings	X	X			X		X	X	X		X
Schedules of Watertight Integrity Tests & inspections	X	X			X		X	X	X		X
Tank Capacity and Vertical Center of Gravity Curves	X	X			X		X	X	X		X
Booklet of Tank Sounding Tables	X	X			X		X	X	X		X
Running, Signal and Anchor Lights (Location Drawing) (To be included in Booklet of General Drawings.)	X	X			X		X	X	X		X
Main Steam Systems Diagrams	X	X			X		X				
Auxiliary Steam System Diagrams	X	X			X		X	X			X
High Pressure Steam Drain Systems Diagrams	X	X			X		X				
Condensate System Diagrams	X	X			X		X				
Feed System Diagrams and Reserve and Makeup Feed	X	X			X		X				
Main Sea Water Cooling System Diagrams	X	X			X		X	X	X		X
Auxiliary Sea Water Cooling System Diagrams	X	X			X		X	X	X		X
Steam Operated Distilling System	X	X			X		X	X			X

TABLE I-C-1**LEGEND: X = Required by FMP Manual**

**TABLE I, SECTION C
SELECTED RECORD DRAWINGS**

DRAWING TITLE	SHIP: LCC 19	LHA	LHD 1	LHD 8(TBD)	LPD 17	LPD 17	LSD 36	LSD 41/49	MCM	MHC	MSO
Steering Gear Hydraulic Systems Diagrams	X	X			X		X	X			X
High Pressure Air System Diagrams (Inci MP)	X	X			X		X	X			X
60 HZ A.C. Power Distrn System Diagrams	X	X			X		X	X	X		X
400 HZ A.C. Power Distrn System Diagrams	X	X			X		X	X	X		X
Low Pressure Steam Drain System Diagrams	X	X			X		X				
Fresh Water Drain Collecting System Diagrams	X	X			X		X				
Steam Plant Control System Diagrams (Including Steam Plant Control Panel and Benchboards)	X	X			X		X				
Ships Service Power Sources Diagram (Including equipments such as SSTGs, SSMGs, CTG, Diesel Generators, Batteries that are not included in Power Distribution Systems above)	X	X			X		X	X	X		X
Main Lube Oil System Diagrams	X	X			X		X	X			X
Lube Oil Fill, Transfer And Purification System Diagrams	X	X			X		X	X			X

TABLE I-C-2

**TABLE I, SECTION C
SELECTED RECORD DRAWINGS**

DRAWING TITLE	SHIP: LCC 19	LHA	LHD 1	LHD 8(TBD)	LPD	LPD 17	LSD 36	LSD 41/49	MCM	MHC	MSO
Ships Service Circulating Water System Diagrams (Those Portions associated with the Propulsion Plant)	X	X				X	X	X			X
Steam Plant Salinity Indicator System Diagrams	X	X				X	X				
Service and Control Air Systems Diagrams (Those portions associated with the propulsion plant)	X	X				X	X	X			
Asbestos Removal Drawings	X	X				X	X	X			X
HVAC Diagrammatic and System Control Drawings	X	X				X	X	X	X		X
Ordnance Handling Drawings		X				X	X	X			
Fire Fighting Systems Diagrams	X	X				X	X	X	X		X
Electronic Cooling Water Systems Diagrams	X	X				X	X	X			
Helo Landing and Signal Lighting System Diagrams	X	X				X	X	X			
H.P. Auxiliary Steam System Diagrams	X	X				X	X	X			X
Dirty Drain System Diagrams											
Auxiliary Exhaust Steam System Diagrams	X	X				X	X	X			X
Gland Sealing Steam System Diagrams	X	X				X	X				

TABLE I-C-3

**TABLE I, SECTION C
SELECTED RECORD DRAWINGS**

DRAWING TITLE	SHIP: LCC 19	LHA	LHD	LHD 8(TBD)	LPD 17	LPD 17	LSD 36	LSD 41/49	MCM	MHC	MSO
Automated Assault System Drawings (All LHA Ships Only)		X									
Automated Propulsion System Drawings (All LHA Ships Only)		X									
Auxiliary Gland Leak-Off System Diagrams	X	X			X		X				
Air Vent Piping System Drawings	X	X			X		X	X			
LP Air System Diagrams	X	X			X		X	X			X
Flooding Effect and Liquid Loading	X	X			X		X	X			X
Sub-Division First Platform and Below	X	X			X		X	X			X
Sub-Division Main Deck and Above	X	X			X		X	X			X
JP-5 Filling, Transfer, and Overflow Systems	X	X			X		X	X			
Casualty Power Supply Systems	X	X			X		X	X			X
Casualty Communications Systems	X	X			X		X	X			
Vital DMG CTL Elect Eqpt and Power Supply Chart	X	X			X		X	X			
Communications Directory	X	X			X		X	X			

TABLE I-C-4

**TABLE I, SECTION C
SELECTED RECORD DRAWINGS**

DRAWING TITLE	SHIP: LCC 19	LHA	LHD	LHD 8(TBD)	LPD	LPD 17	LSD 36	LSD 41/49	MCM	MHC	MSO
Potable (Propulsion Plant) Support Water Fill, Transfer, Service and Purification System (Mchry Space)	X	X			X		X	X	X		X
Chilled Water Systems Drawings	X	X			X		X	X			
Main and Secondary Drainage System Drawings	X	X			X		X	X			
Oily Water Transfer System Drawings	X	X			X		X	X			X
CIC Arrangement of Eqpt	X	X			X		X	X	X		
Boiler Blow System Diagram	X	X			X		X	X			X
Pilot House and Bridge Wing Arrangement of Eqpt	X	X			X		X	X	X		X
Computer Room Arrangement of Eqpt	X	X									
Communications Central Arrangement of Eqpt	X	X			X		X	X	X		X
Topside Arrangement Drawings	X	X			X		X	X	X		X
Compartment and Access Drawings	X	X			X		X	X	X		X
Topside Ant Sys Arrangement	X	X			X		X	X	X		X
Propulsion Control System Diagrams									X		
150 # Auxiliary Steam System Diagrams											

TABLE I-C-5**LEGEND: X = Required by FMP Manual**

**TABLE I, SECTION C
SELECTED RECORD DRAWINGS**

DRAWING TITLE	SHIP: LCC 19	LHA	LHD	LHD 8(TBD)	LPD 17	LSD 36	LSD 49	MCM	MHC	MSO
Fuel Oil Transfer Systems Diagrams	X	X			X	X	X			X
Fuel Oil Stripping System Diagrams	X	X			X	X	X			X
Fuel Oil Service System	X	X			X	X	X			X
Prairie/Masker Compressed Air System Drawings										
Electrical Load Analysis	X	X			X	X	X	X		X
Bleed Air System Drawings (Gas Turbine Propulsion Only)										
H.P. Air Start System Drawings (Gas Turbine and Diesel Propulsion Only)							X			
Dirty Oil Drain System Drawings (Gas Turbine and Diesel Propulsion Only)							X			
Air Inlet System Drawings (Gas Turbine and Diesel Propulsion Only)							X			
Air Inlet Separator System Drawings (Gas Turbine and Diesel Propulsion Only)							X			
Muffler System Drawings (Gas Turbine and Diesel Propulsion Only)							X			

TABLE I-C-6

**TABLE I, SECTION C
SELECTED RECORD DRAWINGS**

DRAWING TITLE	SHIP: LCC 19	LHA	LHD	LHD 8(TBD)	LPD	LPD 17	LSD 36	LSD 41/49	MCM	MHC	MSO
Sonar, MNV and Electronics Room Arrangement of Equipment									X		
Degaussing Coils Location Drawings									X		
Mine Countermeasures Handling									X		
ACC/FWC System Diagrams	X	X			X		X				

TABLE I-C-7

**TABLE II
SELECTED RECORD DRAWINGS**

DRAWING TITLE	SHIP: CLASS:	CV ALL	CVN ALL
Docking Drawings		X	X
Booklet of General Drawings		X	X
Tank Capacity and Vertical Center of Gravity Curves		X	X
Booklet of Tank Sounding Tables		X	X
Steering Gear Hydraulic System Diagrams & Related I.C. Systems Diagrams		X	X
High Pressure Air System Diagrams (Including MP)		X	X
60HZ A.C. Power Distribution System Diagrams (From Load Center Boards to Vital Service Panels)		X	X
400HZ A.C. Power Distribution System Diagrams & Aircraft Servicing Diagram		X	X
Ships Service Power Sources Diagram (Including equipment such as SSTGs, SSMGs, CTGs, Diesel Generators, Batteries that are not included in Power Distribution Systems above. Generators to Main Boards to Load CTR Boards)		X	X
Electric Plant Control System Diagrams (Including Electric Plant Control Panel and Benchboard)		X	X
Main Lube Oil System Diagrams		X	X
Control Air System Diagrams (Steam Plant)		X	X
Asbestos Removal Drawings		X	X

TABLE II-1

**TABLE II
SELECTED RECORD DRAWINGS**

DRAWING TITLE	SHIP: CLASS:	CV ALL	CVN ALL
HVAC Diagrammatic & System Control Drawings		X	X
JP-5 Service Diagram (From Service Pump Disch to Aircraft Fuel Stations)		X	X
Firemain System Diagram		X	X
Firefighting System Diagrams (Fixed Systems including AFFF, Flight Deck Conflagration, Hangar Deck Sprinkling, Mchry Space Halon Systems and C02 Hose Reel w/50# Bottles)		X	X
Visual Landing Aids & Signal Lighting System Diagrams		X	X
Auxiliary Steam System Diagrams (CV; Propulsion Plant Support, no hotel services. CVN: Includes reduced pressure steam and auxiliary exhaust, escape & extraction steam)		X	X
LP Air System Diagrams		X	X
Fuel Oil Service System Diagram		X	
CIC Arrangement of Equipment		X	X
CATCC (ICA) Arrangement of Equipment		X	X
Pilot House & Bridge Wing Arrangement of Equipment		X	X
Communication Central Arrangement of Equipment		X	X
Fly Control Arrangement of Equipment		X	X
Tactical Flag Command Center Arrangement of Equipment (TFCC)		X	X
Aircraft and Weapons Elevator System Hydr & Elect Control Diagrams		X	X

TABLE II-2

**TABLE II
SELECTED RECORD DRAWINGS**

DRAWING TITLE	SHIP: CV CLASS: ALL	CVN ALL
Catapult Steam System Diagram	X	X
Catapult Blowdown Steam Drain/Steam Blowdown System Diagram	X	X
Catapult Fill Valve Control System Diagram	X	X
Lifeboat Arrg't & Stowage Drawing	X	X
Ordnance Handling Diagrams (Including Stowage in space and route of weapons in/out)	X	X
Most Recent Catapult Slot Expansion Data	X	X
Low Pressure Steam Drain System Diagrams		X
		X
Steam Plant Control System Diagrams (Including Steam Plant Control Panel and Switch Boards)	X	X
Electric Plant Temperature Monitoring System Diagrams	X	X
Shaft Lube Oil System Diagrams	X	X
Propulsion Plant Temperature Monitoring System Diagrams	X	X
Propulsion Speed Indicator System Diagrams	X	X
Steam Plant Alarm System Diagrams	X	X

Steam Plant Salinity Indicator System Diagrams

X

X

TABLE II-3

TABLE II
SELECTED RECORD DRAWINGS

DRAWING TITLE	SHIP: CV CLASS: ALL	CVN ALL
Topside Antenna Arrangement Diagram	X	X
Electric Load Analysis	X	X
Displacement & Other Curves		X

TABLE II-4

**TABLE III
SELECTED RECORD DRAWINGS**

SHIP: CLASS:	SSBN 726	SSN /637	SSN 688/21/774
DRAWING TITLE			
Docking Drawings	X	X	X
Booklet of General Drawings	X	X	X
Compartment and Tank-Testing Requirements	X	X	X
Tread Ballast Stowage Arrangement Drawings	X	X	X
Salvage System Drawings and Diagrams	X	X	X
Escape and Rescue Arrangement (Note: Where this information is duplicated by a corresponding diagram in the General Information Book (GIB) or Ship Information Book (SIB) this drawing is not required)	X	X	X
SUBSAFE Mapping Drawings	X	X	X
Flexible Connections List	X	X	X
Consolidated Hull Zinc List	X	X	X
Running, Signal and Anchor Lights (Location drawing) (To be included in Booklet of General Drawings.)	X	X	X
Main Steam Systems Diagrams	X	X	X
Auxiliary Steam System Diagrams	X	X	X
High Pressure Steam Drain Systems Diagrams	X	X	X
Condensate System Diagrams	X	X	X
Feed System Diagrams	X	X	X
Main Sea Water Cooling System Diagrams	X	X	X

TABLE III-1

LEGEND: X = Required by FMP Manual
*** = SUBSAFE**

**TABLE III
SELECTED RECORD DRAWINGS**

SHIP: CLASS:	SSBN 726	SSN 637	SSN 688/21/774
DRAWING TITLE			
Auxiliary Sea Water Cooling System Diagrams	X	X	X
Steam Operated Distilling System Diagrams	X	X	X
Test Data On Items Subject To Sea Pressure	X	X	X
Hydraulic System Diagrams (Main Vital and External)	X	X	X
Hydraulic System Diagrams Missile (SSBNs Only)	X		
Steering and Diving Gear Hydraulic Systems Diagrams	X	X	X
Main Oxygen System Diagrams	X	X	X
Trim and Drain Systems Diagrams	X	X	X
High Pressure. Air System Diagrams	X	X	X
High Pressure Ballast Tank Blow System Diagrams	X	X	X
60 HZ A.C. Power Distrn System Diagrams	X	X	X
400 HZ A.C. Power Distrn Systems Diagrams	X	X	X
DC and Propulsion Power Distrn System Diagrams	X	X	X
Low Pressure Steam Drain System Diagrams	X	X	X
Fresh Water Drain Collecting System Diagrams	X	X	X
Steam Plant Control System Diagrams (Including Steam Plant Control Panel and Benchboards)	X	X	X

TABLE III-2

LEGEND: X = Required by FMP Manual

**TABLE III
SELECTED RECORD DRAWINGS**

SHIP: CLASS:	SSBN 726	SSN 637	SSN 688/21/774
DRAWING TITLE			
Ships Service Circulating Water System Diagrams (Those portions associated with the Propulsion Plant)	X	X	X
Engine Room Fresh Water Coolant System (Auxiliary Fresh Water) Diagrams	X	X	X
Ships Service Power Sources Diagrams (Including equipments such as SSTGs, SSMG, CTGs, Diesel Generators, Batteries that are not included in Power Distribution Systems above)	X	X	X
Electric Plant Temperature Monitoring System Diagrams	X	X	X
Electric Plant Control System Diagrams (Including Electric Plant Control Panel and Benchboard)	X	X	X
Main Lube Oil System Diagrams	X	X	X
SSTG Lube Oil System Diagrams	X	X	X
Shaft Lube Oil System Diagram's	X	X	X
Clutch Control Oil System Diagrams	X	X	X
Lube Oil Fill, Transfer and Purification System Diagrams	X	X	X
Propulsion Plant Temperature Monitoring System Diagrams	X	X	X
Propulsion Speed Indicator System Diagrams	X	X	X

TABLE III-3

**TABLE III
SELECTED RECORD DRAWINGS**

SHIP: CLASS:	SSBN 726	SSN 637	SSN 688/21/774
DRAWING TITLE			
Steam Plant Alarm System Diagrams	X	X	X
Steam Plant Salinity Indicator System Diagrams	X	X	X
Air Conditioning System and Ventilation Diagrams (Those portions associated with reactor compartment and other propulsion spaces)	X	X	X
Service Air System Diagrams (Those portions associated with the Propulsion Plant)	X	X	X
Steam Plant Pneumatic Control Air System Diagrams	X	X	X
Depth Detecting System Diagrams	X	X	X
Noise Review Road Map for Noise Critical Systems	X	X	X
Control Air Systems Diagrams (Those portions associated with the propulsion plant)	X	X	X
Moment Diagram and Ship's Polygon	X	X	X
Displacement and Other Curves	X	X	X
Tank Capacity Curves, Curves of Center of Gravity and Curves of Moments of Inertia	X	X	X
Asbestos Removal Drawings(except 21 & 774 cl)	X	X	X
Propulsion Lube Oil Diagrams		X	
Gland Seal and Exhaust Diagrams	X		X
Composite Hull Penetration Drawings	X		X

TABLE III-4

LEGEND: X = Required by FMP Manual

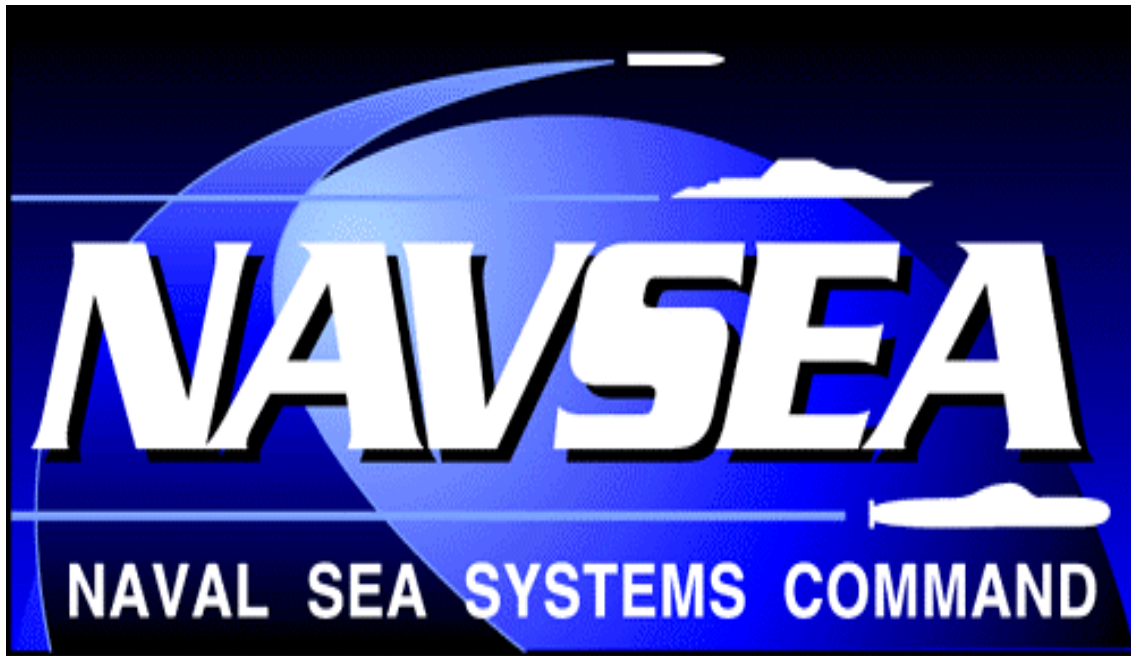
**TABLE III
SELECTED RECORD DRAWINGS**

SHIP: CLASS:	SSBN 726	SSN 637	SSN 688/21/774
DRAWING TITLE			
Missile Tube Capacity and Other Curves	X		X
List of Resilient Mounts	X		X
List of Grease Fittings	X		
List of Throated Plugs in Sea Connected Systems	X		X
Defensive Weapon Handling and Launching Systems	X		
Strategic Weapon Fluid System Diagrams	X		
Strategic Weapon Electrical System Diagrams	X		
Strategic Weapon Electrical System Wiring Tables	X		
Low Pressure Ballast Tank Blow Diagrams	X		X
Diesel Generator Sea Water Cooling Diagrams	X		X
Potable Water Diagrams	X		
Electronics and Auxiliary Fresh Water Cooling Diagrams	X		
Refrigeration Diagrams	X		
Chilled Water Diagrams	X		
Fuel Oil Diagrams	X		
Compensating Systems Diagrams	X		
Plumbing Diagrams	X		
Vertical Launch System Flood and Drain System Diagram			X
Towed Sonar Array Stowage Tube Arrangement			X

TABLE III-5

TABLE IV
SELECTED RECORD DRAWINGS FOR
ALL SHIPS NOT SPECIFIED IN TABLES I THRU III

Docking Drawings	X
Schedules of Watertight Integrity Tests and Inspections (except service craft)	X
Tank Capacity and Vertical Center of Gravity Curves	X
Booklet of Tank Sounding Tables	X
Booklet of General Drawings	X
Asbestos Removal Drawings	X
Underway Replenishment Drawings (UNREP)*	X



APPENDIX B

PLANNING YARD ASSIGNMENT MATRIX

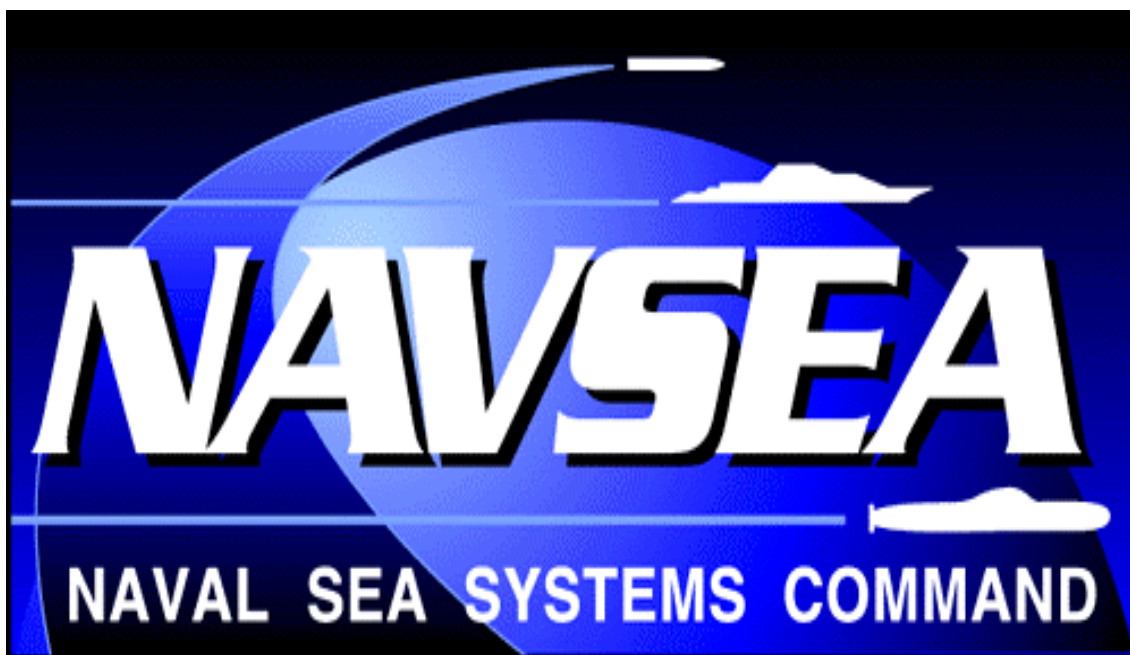
APPENDIX B PLANNING YARD ASSIGNMENT MATRIX

SHIP TYPE	SHIP CLASS	PLANNING YARD	SPM
AFDB	0009	PUGET SOUND BOSTON DETACH	PMS325
AFDL	ALL	NORFOLK NAVAL SHIPYARD	PMS325
AGF	0003	PUGET SOUND BOSTON DETACH	PMS470
AGF	0011	PUGET SOUND BOSTON DETACH	PMS470
AGSS	0555	PORTSMOUTH NAVAL SHIPYARD	PMS395
AOE	ALL	PUGET SOUND NAVAL SHIPYARD	PMS325
APL	ALL	PUGET SOUND BOSTON DETACH	PMS325
ARDM	ALL	NORFOLK NAVAL SHIPYARD	PMS325
ARS	0050	PUGET SOUND NAVAL SHIPYARD	PMS325
AS	0039	NORFOLK NAVAL SHIPYARD	PMS325
CG	0047	NORTHROP GRUMAN SHIP SYSTEMS	PMS400
CV	0063	PUGET SOUND NAVAL SHIPYARD	PMS312
CV	0067	NORFOLK NAVAL SHIPYARD	PMS312
CVN	0065	PUGET SOUND NAVAL SHIPYARD/ NEWPORT NEWS SHIPBUILDING(R)	PMS312
CVN	0068	NORFOLK NAVAL SHIPYARD/ NEWPORT NEWS SHIPBUILDING(R)	PMS312
DD	0963	NORTHROP GRUMAN SHIP SYSTEMS	PMS400
DDG	0051	BATH IRON WORKS	PMS400
DSRV	ALL	PORTSMOUTH NAVAL SHIPYARD	PMS395
DSV	ALL	PORTSMOUTH NAVAL SHIPYARD	PMS325
FFG	0007	BATH IRON WORKS	PMS400
IX	ALL	PUGET SOUND BOSTON DETACH	PMS325
LCAC	ALL	PUGET SOUND BOSTON DETACH	PMS470
LCC	0019	PUGET SOUND BOSTON DETACH	PMS470
LHA	0001	NORFOLK NAVAL SHIPYARD	PMS470
LHD	0001	NORFOLK NAVAL SHIPYARD	PMS470

SHIP TYPE	SHIP CLASS	PLANNING YARD	SPM
LPD	ALL	PUGET SOUND BOSTON DETACH	PMS470
LSD	ALL	PUGET SOUND BOSTON DETACH	PMS470
LST	1179	PUGET SOUND BOSTON DETACH	PMS470
MCM	0001	PUGET SOUND NAVAL SHIPYARD	PMS490
MHC	0051	PUGET SOUND NAVAL SHIPYARD	PMS490
NR	0001	ELECTRIC BOAT GROTON	PMS395
PC	ALL	PUGET SOUND BOSTON DETACH	PMS325
SSBN	0726	ELECTRIC BOAT GROTON/ ELECTRIC BOAT GROTON(R)	PMS392
SSN	0021	NEWPORT NEWS SHIPBUILDING/ ELECTRIC BOAT GROTON(R)	PMS392
SSN	0637	PUGET SOUND NAVAL SHIPYARD/ ELECTRIC BOAT GROTON(R)	PMS392
SSN	0642	PORTSMOUTH NAVAL SHIPYARD/ ELECTRIC BOAT GROTON(R)	PMS392
SSN	0671	ELECTRIC BOAT GROTON ELECTRIC/ BOAT GROTON(R)	PMS392
SSN	0688	NEWPORT NEWS SHIPBUILDING/ ELECTRIC BOAT GROTON(R)	PMS392
TAE	0026	MILITARY SEALIFT COMMAND	PMS325
TAFS	ALL	MILITARY SEALIFT COMMAND	PMS325
TAG	0195	MILITARY SEALIFT COMMAND	PMS325
TAGM	0023	MILITARY SEALIFT COMMAND	PMS325
TAGOS	ALL	MILITARY SEALIFT COMMAND	PMS325
TAGS	ALL	MILITARY SEALIFT COMMAND	PMS325
TAH	0019	MILITARY SEALIFT COMMAND	MSC
TAKR	ALL	MILITARY SEALIFT COMMAND	MSC
TAO	0187	MILITARY SEALIFT COMMAND	PMS325
TARC	0007	MILITARY SEALIFT COMMAND	PMS325
TATF	0166	MILITARY SEALIFT COMMAND	PMS325

SHIP TYPE	SHIP CLASS	PLANNING YARD	SPM
YC	ALL	PUGET SOUND BOSTON DETACH	PMS325
YCF	0014	PUGET SOUND BOSTON DETACH	PMS325
YCV	0007	PUGET SOUND BOSTON DETACH	PMS325
YD	ALL	PUGET SOUND BOSTON DETACH	PMS325
YDT	ALL	PUGET SOUND BOSTON DETACH	PMS325
YFB	ALL	PUGET SOUND BOSTON DETACH	PMS325
YFD	ALL	PUGET SOUND BOSTON DETACH	PMS325
YFN	ALL	PUGET SOUND BOSTON DETACH	PMS325
YFNB	ALL	PUGET SOUND BOSTON DETACH	PMS325
YFND	ALL	PUGET SOUND BOSTON DETACH	PMS325
YFNX	ALL	PUGET SOUND BOSTON DETACH	PMS325
YFP	ALL	PUGET SOUND BOSTON DETACH	PMS325
YFU	ALL	PUGET SOUND BOSTON DETACH	PMS325
YLC	ALL	PUGET SOUND BOSTON DETACH	PMS325
YNG	ALL	PUGET SOUND BOSTON DETACH	PMS325
YOGN	ALL	PUGET SOUND BOSTON DETACH	PMS325
YON	ALL	PUGET SOUND BOSTON DETACH	PMS325
YOS	ALL	PUGET SOUND BOSTON DETACH	PMS325
YP	ALL	PUGET SOUND BOSTON DETACH	PMS325
YPD	ALL	PUGET SOUND BOSTON DETACH	PMS325
YR	ALL	PUGET SOUND BOSTON DETACH	PMS325
YRB	ALL	PUGET SOUND BOSTON DETACH	PMS325
YRBM	ALL	PUGET SOUND BOSTON DETACH	PMS325
YRDH	ALL	PUGET SOUND BOSTON DETACH	PMS325
YRDM	ALL	PUGET SOUND BOSTON DETACH	PMS325
YRR	ALL	PUGET SOUND BOSTON DETACH	PMS325
YSD	ALL	PUGET SOUND BOSTON DETACH	PMS325

SHIP TYPE	SHIP CLASS	PLANNING YARD	SPM
YTB	ALL	PUGET SOUND BOSTON DETACH	PMS325
YTL	ALL	PUGET SOUND BOSTON DETACH	PMS325
YTT	ALL	PUGET SOUND BOSTON DETACH	PMS325
YWN	ALL	PUGET SOUND BOSTON DETACH	PMS325



APPENDIX C

SHIP SELECTED RECORDS

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SHIP SELECTED RECORDS

C.1. SCOPE

Ship Selected Records (SSRs) comprise hull level system technical documentation, specifically designated by the Chief of Naval Operations (CNO), which is maintained current throughout the life of the ship. SSRs consist of three major categories; Selected Record Drawings (SRDs), Selected Record Data, and Allowance Lists. Each of these major SSR categories contains information of significant value to ships operations, maintenance, modernization, training, and logistics requirements.

This appendix is applicable to other than Reactor Plant SSR requirements. The identification and description of specific SSRs in each category as well as detailed specifications and procedures for other than Reactor Plant SSR maintenance are discussed in Section 4-11 of this manual. Reactor Plant SSR requirements are contained in Section 4-12 of this manual.

The Planning Yard (PY) is responsible for all SSRs. It maintains a master file containing a final reproducible copy of SSR and updates the Selected Record Drawings and Data. The PY/Technical Manual Maintenance Activity (TMMA) shall maintain a current list of all SSR Technical Manuals (TMs). The PY/In-Service Engineering Agent (ISEA) shall maintain a current list of all SSR drawings. NAVICP shall maintain the master file of the allowance lists.

The Naval Supervising Activity (NSA) is responsible for marking-up PY provided SSRs of surface nuclear ships and submarines undergoing availabilities to reflect installed configuration changes and all changes reported by forces afloat. This mark-up is provided to the PY who, with the support of the appropriate TMMA/ISEA updates the final reproducible copy and prints and distributes at the End Of Availability (EOA+3).

Additions and deletions to the SSR listed herein can only be made with the approval of CNO. Recommendations for additions or deletions to the SSR listings shall be submitted to CNO via the Naval Sea Systems Command (NAVSEA). Upon approval by CNO, NAVSEA will promulgate appropriate changes.

C.2. APPLICABLE DOCUMENTS

MIL-DTL-24784	Manuals, Technical; General Acquisition and Development Requirements
MIL-M-38761/2	Microfilm and Tabulating Cards used for Recording Engineering Drawings and Associated Data
MIL-STD 1916	DOD Preferred Methods For Acceptance of Product
NAVSEA 0902-LP-018-2010	General Overhaul Specifications for Deep Diving SSN/SSBN Submarines
NAVSEA 0902-LP-002-2000	Consolidated Index, Drawing, Conversion
NAVSEA 0924-LP-062-0010	Submarine Safety Requirements Manual
NAVSEA SL105-AA-PRO	ILO Policy and Procedures Manual (010 through 070 Series)

NAVSEA S0000-00-IDX-000/TMINS	Description and Application Guide for NAVSEA Standard Technical Manual Identification Numbering System (TMINS)
NAVSEAINST 4160.3	Technical Manual Management Program (TMMP)
NAVSHIPS 0900-LP-002-2000	Ship Work Breakdown Structure
OPNAVINST 4441.12, Series	Retail Supply Support of Naval Activities and Operating Forces
OPNAVINST 4790.4	Ship's Maintenance and Material Management (3-M) Manual; Promulgation of
Plan for Managing Logistic Technical Data (LTD) Products and Services in Support of NAVSEA Task 145	
Plan for Managing Logistic Technical Data (LTD) Products and Services in Support of SSN 688 Class Submarine Depot Modernization Periods (DMPs)	
NAVSEA S9AA0-AB-GOS-010	General Specifications for Overhaul of Surface Ships
T0005-AA-GYD-020/PTII-MAN-MOD ACT	Procedures for Maintaining Non-Reactor Plant System Manuals and Equipment/Component Technical Manuals.
T0005-AA-GYD-010/PTI-MAN	Holders (Part I - Responsibilities)
Technical Specification 9090-700	Ships Configuration and Logistics Support Information System.
Technical Specification 9090-800	Selected Record Drawings, Appendix A
Technical Specification 9090-810	Damage Control Drawings Computer Aided Drafting Requirements
Technical Specification 9090-820	Preparation and Revision of Damage Control Books and Diagrams for U.S. Navy Surface Ships;
Technical Specification 9090-821	Promulgation of Preparation and Revision of Damage Control Books and Diagrams for U.S. Navy

C.3 REQUIREMENTS

C.3.1 SELECTED RECORD DRAWINGS (SRDs)

C.3.1.1 General. SRDs consist of important basic hull, mechanical, equipment, and related information about the ship and are selected for their value for operational, maintenance, modernization, training, and consulting purposes to individual ship's forces, Fleet commands, shipyard personnel, PY personnel, training centers, and other naval activities. The drawings designated as SRDs are to be maintained current and up-to-date throughout the life of the ship.

Appendix A of NAVSEA Technical Specification 9090-800 identifies the hull-level requirements by ship class for the drawings currently designated as SRDs. Recommendations for additions or deletions to the list of SRDs shall be submitted to the CNO via NAVSEA. Upon approval by CNO, NAVSEA will promulgate a change to the specification.

C.3.1.2 Expanded Drawing Baselines. The number of SRDs required for each ship varies with

the ship class. The required size of the drawing baseline has been increased for most ships. The PYs will produce the additional drawings on a ship-by-ship basis as tasked by the Ship Program Manager (SPM). The PY shall assume the full maintenance responsibility in accordance with Section 4 of this manual for each ship's total SRD suite upon completion of the expanded baseline. Thereafter, the PY will document configuration changes occurring during the ship's availabilities and operational intervals. For other ships, the maintenance and update action shall be performed in accordance with Section 4 of this manual.

C.3.2 SELECTED RECORD DATA

C.3.2.1 General. Selected Record Data is that important basic technical information relative to certain shipboard arrangements, equipment, and systems under the cognizance of NAVSEA that is selected for its value for operational, maintenance, modernization, training, and consulting purposes, to an individual ship's force, fleet commands, PYs, NSAs, training commands, and other naval activities. The data items designated as Selected Record Data are to be maintained current and up-to-date throughout the life of the ship concerned.

Table C-I is a listing of data currently designated as Selected Record Data. Recommendations for additions or deletions to the List of Selected Record Data shall be submitted to the CNO via NAVSEA. Upon approval by CNO, NAVSEA will promulgate a change to Table C-I.

C.3.2.2 Updating Selected Record Data. The requirements of individual activities relative to maintaining and updating Selected Record Data shall be in accordance with Section 4 of this manual. NAVSEAINST 4160.3 provides NAVSEA policy for the maintenance of NAVSEA TMs. Specific requirements for Selected Record Data are detailed in Table C-I. Maintenance of Selected Record Data for SSN 21 Class, SSN 688 Class AND SSN 774 Class submarines shall be in accordance with the procedures of T0005-AA-GYD-020/PTII-MAN-MOD ACT, T0005-AA-GYD-010/PTI-MAN, the plans for managing LTD Technical Products and Services in support of NAVSEA Task 145, and SSN 21 Class, SSN 688 Class and SSN 774 Class submarine Depot Modernization Periods (DMPs).

TABLE C-I. Selected Record Data.

KEY:

Column 1 - Surface Ships (Non-nuclear powered)

Column 2 - Surface Ships (Nuclear powered)

Column 3 - SSN Submarines

DATA TITLE	1	2	3
Ship Information Book (SIB) or General Information Book (GIB) or Ship System Manual (SSM) or System Operation and Onboard Maintenance Manual (SOOMM)	X	X	X
Technical Manuals for Systems (MIL-M-15071 Type III Manuals)	X	X	X
Damage Control Books and Plates (not applicable to SSN Classes)	X	X	X
Combat System Technical Operations Manual (CSTOM) (5)	(1)		
Combat System Alignment Manual (CSAM) (4)	X	X	
Training Aid Booklet (TAB) or Propulsion Operating Guide (POG)	X	X	X
Ship's Drawing Index (SDI) or Modified Ship's Drawing Index (MSDI)	X	X	X
Index of Technical Publications (ITP)	X	X	X
Engineering Operational Sequencing System (EOSS) (3)	X		
Propulsion Plant Manuals (for 1200 PSI Ships) (3)	X		
Steam and Electric Plant Manuals (for nuclear-powered ships) and TM's IAW NAVSEAINST 9890.29		X	(2)
Submarine Safety Certification Boundary (SSCB) Book			X
Ship Valves Technical Manual		X	X
Ship Service Motors and Controllers Technical Manual		X	X
Technical Manuals for Components in Systems Listed Below:			
Main Steam System		X	X
Auxiliary Steam System		X	X
High Pressure Steam System		X	X
Combat System Operational Sequencing System (CSOSS) (4)	(5)		
Aviation Fuel Operational Sequencing System (AFOSS) (3)	X	X	
Cargo Fuel Operational Sequencing System (CFOSS) (3)	X		
Fuel Operational Sequencing System (FOSS) (3)	X		
Sewage Disposal Operational Sequencing System (SDOSS) (3)	X	X	
Ballasting Operational Sequencing System (BOSS) (3)	(7)		
Catapult Operational Sequencing System (CATOSS) (3)	(8)		
Weapons Elevator Operational Procedures System (WEOPS) (3)	(9)		
Auxiliary Operational Sequencing System (AUXOSS) (3)	X	X	
Condensate System		X	X
Feed System		X	X
Main Sea Water Cooling System		X	X
Auxiliary Sea Water Cooling System		X	X
Steam Operated Distilling System		X	X
Hydraulic System (Main, Vital and External)		X	X
Steering and Diving Gear Hydraulic System			X
Main Oxygen System			X
Trim and Drain System			X
High Pressure Air System		X	X
High Pressure Ballast Tank Blow System			X
60 Hz A.C. Power Distribution System		X	X

DATA TITLE	1	2	3
400 Hz A.C. Power Distribution System			X
D.C. Propulsion Power Distribution System			X
Low Pressure Steam Drain System		X	X
Fresh Water Drain Collection System		X	X
Steam Plant Control System (including Steam Plant Control Panel and Benchboard)		X	X
Ships Service Circulating Water System		X	X
Engine Room Fresh Water Coolant System		X	X
Ships-Service Power Sources including: SSTGs		X	X
SSMGs		X	X
Diesel Generators		X	X
Batteries		X	X
Magnetic Material Control Drawing		(6)	
Electromagnetic Interference (EMI) Control Booklet		(6)	
Hull/Structural Repair Configuration Control Document		(6)	
Electric Plant Temperature Monitoring System			X
Electric Plant Control System (including Electric Plant Control Panel and Benchboards)			X
Propulsion Turbines, Reduction Gears, and Associated Control System		X	X
Main Lube Oil System		X	X
SSTG Lube Oil System		X	X
Shaft Lube Oil System		X	X
Clutch Control Oil System		X	X
Lube Oil Fill, Transfer and Purification System		X	X
Propulsion Plant Temperature Monitoring System		X	X
Propulsion Speed Indicator System		X	X
Steam Plant Alarm System		X	X
Steam Plant Salinity Indicator System		X	X
Electric Propulsion System		X	X
Air Conditioning System (those portions associated with reactor compartment and other propulsion spaces)		X	X
Service Air Systems (those portions associated with the Propulsion Plant)		X	X
Control Air Systems (those portions associated with the Propulsion Plant)		X	X
Steam Plant Pneumatic Control Air System		X	X
Emergency Propulsion Motor		X	X
Depth Detecting System			X

NOTES:

- (1) CG-47, DD-963, and FFG-7 Classes
- (2) SSN 21, SSN 688 and SSN 774 Classes
- (3) Under the technical cognizance of NSWCCD-SSES Philadelphia
- (4) Under the technical cognizance of NSWC Port Hueneme
- (5) CG-47, DD-963, and DDG-51 Classes
- (6) MCMs and MHCs
- (7) LHAs, LHDs, LPDs, and LSDs.
- (8) CVs and CVNs
- (9) Combatant ships with weapon elevators only

C.3.2.2.1 Numbering of Selected Record Data. NAVSEA TM numbers, revision numbers and change numbers, as applicable, shall be utilized in accordance with NAVSEA S0000-00-IDX-000/TMINS for Selected Record Data. NAVSEA numbers may be obtained from the Naval Sea Data Support Activity (NSDSA). Each volume of a multi-volume document shall be considered as an individual document and numbered accordingly. A unique NAVSEA number shall be assigned, on an individual basis, to each Selected Record Data item listed below:

- a. Ship Information Book (SIB), General Information Book (GIB) or Ship System Manuals (SSMs) or System Operation and Onboard Maintenance Manual
- b. Technical Manuals for Systems (MIL-DTL-24784) Type III Manuals
- c. Damage Control Books and Plates (not applicable to SSN classes)
- d. Training Aid Booklet (TAB) or Propulsion Operating Guide (POG)
- e. Ship's Drawing Index (SDI) or Modified Ship's Drawing Index (MSDI)
- f. Index of Technical Publications (ITP)
- g. Steam and Electrical Plant Manuals (for nuclear powered ships) and Technical Manuals (TMs)
- h. Submarine Safety Certification Boundary (SSCB) Book
- i. Ships Valves Technical Manual
- j. Ship Service Motors and Controllers Technical Manual
- k. Other Type III System Manuals

C.3.2.2.2 Updating Existing Selected Record Data. The PY will provide the NSA two sets of SSRs (Drawings and Data) reproducibles updated to the authorized EOA configuration, upon request from the NSA/IA at about A-4. The NSA is required to mark-up the reproducibles to show changes authorized for installation subsequent to the PY update, data submitted by Ship's Force in the pre-availability package or during the availability, and to incorporate all changes required to interface with other update actions. The NSA will provide one set of marked-up SSRs to the PY and an identical set to the ship as interim SSRs. Between availabilities, the PY will update data masters in accordance with Section 4 of this manual.

Tabular data are to be updated as required. Illustrations are to be updated by overlay or replacement and limited to one text page. Plate diagrams are to be updated as required.

A change is comprised of corrected pages to the basic manual. It consists of information that updates the manual without requiring rewriting or reorganization of the technical content of the basic manual. Changes are to be issued when 25 percent or less of the pages in the document are affected. All changes require change numbers assigned by NSDSA. (see C.3.2.2.1.)

A revision is a subsequent edition of a document which supersedes the preceding edition. A revision shall be issued when more than 25 percent of the pages contained in a document have been changed. A revision shall incorporate all existing changes, and is identified by the Technical Manual Identification Numbering System (TMINS) number obtained from the NSDSA. (see C.3.2.2.1 and C.3.2.2.3.)

For SSN 21 Class, SSN 688 Class AND SSN 774 Class submarines, NSAs are required to submit appropriate change documents (Manual Change Requests (MCRs) or Technical Manual

Deficiency/Evaluation Reports (TMDERs)) to the PY. These change documents will then be processed in accordance with T0005-AA-GYD-020/PTII-MAN-MOD ACT and changes to the TMs shall be produced to meet the availability schedule.

C.3.2.2.3 New Selected Record Data. When alterations have been accomplished that would normally require correction of Selected Record Data as listed in Table C-I, but where these data have not been previously prepared, or where changes to Table C-I are promulgated, the following procedures shall be adhered to:

- a. Unless otherwise authorized, where only a class data item exists, the data item will be corrected to reflect specific ship conditions. The data item will be assigned a unique NAVSEA number (see C.3.2.2.1 above) and designated as the Selected Record Data applicable to the subject ship only. Acquisition of the new data item shall be in accordance with NAVSEAINST 4160.3.
- b. When a specific Selected Record Data item does not exist, or when such data are missing and not available from the PY, or ship, a new original data item is to be prepared (Type I TMs excepted) by the PY.
- c. Whenever the original of a Selected Record Data item (less Type I TMs), because of age, extensive correction, or other reasons, deteriorates, so that legible prints cannot be made, a new data item must be prepared retaining the same NAVSEA number. Problems with Type I TM originals will be processed in accordance with NAVSEAINST 4160.3.

C.3.2.3 Selected Record Data Characteristics. The following paragraphs describe specific Selected Record Data items together with their general updating requirements.

C.3.2.3.1 Ship Information Books (SIBs), General Information Books (GIBs) and Ship System Manuals (SSMs). The SIB and its older counterpart, the GIB, provide a source of technical information concerning shipboard arrangements and systems. The SSN 21 Class, SSN 688 Class AND SSN 774 Class SSM is the primary intra-system and inter-system information and operations manual for all areas except the reactor and propulsion plants.

- a. **Updating SIBs/GIBs/SSMs.** The SIB, GIB and SSM will be updated after any availability during which alterations are accomplished which affected the system, functions, or procedures therein, in accordance with the following guidelines:
 1. In the event that equal or better information is readily available on board a ship in other SRDs, Selected Record Data, or publications, the information should not be duplicated in the SIB/GIB. Instead, the SIB/GIB should be simply annotated to indicate that a change has been accomplished, and reference the source of updated information.
 2. A shipcheck may be required to verify the accuracy of the SIB/GIB following work performed by an NSA.
 3. SIBs for all deep diving SSN submarines shall be updated in accordance with NAVSEA 0902-LP-018-2010 unless otherwise specified under applicable NAVSEA contract.
 4. The SSM shall be updated in accordance with T0005-AA-GYD-020/PTII-MAN-MOD ACT and T0005-AA-GYD-010/PTI-MAN.
- b. **SIB/GIB for Surface Ships.** The SIB for surface ships will normally consist of the following separately bound volumes or portions of volumes. Only those volumes of a ship's

SIB/GIB currently provided will be updated as Selected Record Data. No volume of a SIB is to be added or deleted except by direction of NAVSEA.

1. Volume 1. Hull and Hull Mechanical Systems
2. Volume 2. Machinery Plant
 - Part 1. Propulsion Plant, General Design, and Operating Procedures
 - Part 2. Auxiliary Machinery, Piping, Air Conditioning, Ventilation, and Heating Systems
3. Volume 3. Power and Lighting Systems
 - Part 1. General Description and Design Information of Systems
 - Part 2. General Description of Electric Equipment and Electrically Operated Auxiliaries
4. Volume 4. Electronics Systems
5. Volume 5. Interior Communications Systems
 - Part 1. Interior Communications Systems
 - Part 2. Sound-Powered Telephone Systems, Voice Tubes, and Message Passing Facilities
6. Volume 6. Weapons Control Systems
7. Volume 7. Ballasting Systems

c. **SIB for SSN 637 Class Submarines.** The SIB shall consist of separately bound volumes. No volume is to be added or deleted except by direction of NAVSEA.

- Volume 1. General Information
- Volume 2. Tactical Facilities
- Volume 3. Ship Control System
- Volume 4. Steam and Diesel Propulsion
- Volume 5. Electrical Power System
- Volume 6. Ship Service System
- Volume 7. Hull, Mechanical and Ship Emergency Systems

d. **SSMs for SSN 21 Class, SSN 688 Class AND SSN 774 Class Submarines.** The SSM is organized into seven volumes to facilitate their use. These volumes are broken down into parent chapters, Operating Procedures (OPs), Casualty Procedures (CPs) and Operating Instructions (OIs).

- Volume 1. General Information
- Volume 2. Combat Systems
- Volume 3. Ship Control Systems
- Volume 4. Ship Service Systems
- Volume 5. Principles of Casualty and Damage Control
- Volume 6.
 - Part 1 - System Operating Procedures (OPs)
 - Part 2 - Casualty Procedures (CPs)
 - Part 3 - Operating Instructions (OIs)
- Volume 7. Principles of Ship Control

C.3.2.3.2 **Damage Control Books.** Damage Control Books shall be prepared, corrected, and duplicated in accordance with Section 086 of NAVSEA S9AA0-AB-GOS-010 General Specifications for Overhaul of Surface Ships, and NAVSEA Technical Specifications 9090-810,

9090-820 and 9090-821. The SSN 21 Class, SSN 688 Class and SSN 774 Class submarine does not have a Damage Control Book. For SSN 21 Class, SSN 688 Class and SSN 774 Class, this information is contained in Volumes 5 through 7 of the SSMs (see Section 4 of this manual).

C.3.2.3.3 Training Aid Booklets (TABs). TABs are pocket-sized volumes using functional diagrams and drawings of the ship to depict piping, electrical, and electronic systems. TABs consist of two volumes: (1) Volume 1, Piping Systems, and (2) Volume 2, Electrical and Electronic Systems. For SSN 21 Class, SSN 688 Class and SSN 774 Class submarines, TABs are a collection of selected illustrations taken from the SSM and is furnished for use in conjunction with the SSM. TABs are issued to ship's force for precommissioning training, for personnel qualification, and for operational reference purposes. TABs are generally provided only for submarines. Only those TABs provided for submarines will be updated as Selected Record Data. At EOA+6.

C.3.2.3.4 Posted Information Plates (PIPs). PIPs are selected illustrations and instructions taken from the SSM and equipment technical manuals for SSN 21 Class, SSN 688 Class and SSN 774 Class submarines. They are furnished for training and identification purposes. There are approximately 200 PIPs laminated and affixed directly to or located near the piece of equipment, component, or system involved.

C.3.2.3.5 Propulsion Operating Guide (POG). POGs are pocket-sized documents providing information in summary form of start-up, normal operations, shut-down, damage/casualty control, and trouble shooting procedures and data for the propulsion plant and major auxiliary systems. They are used for familiarization, training, and operation of the main systems by ship's personnel.

C.3.2.3.6 Technical Manuals (TMs). TMs separately describe equipment (Type I manuals) and systems (Type II manuals) where such equipment or systems are of sufficient importance and complexity as to require separate documentation.

While TMs are important items of documentation, not all such TMs are considered as SSR. Only those TMs specifically identified in Table C-I fall within the category of documentation identified as SSR. For the methods of documenting and maintaining TMs that do not qualify as SSR refer to Section 8 of this manual.

Unless otherwise directed by the SPM, only those TMs identified as SSR will be routinely updated under Design Services Allocation (DSA) funding. Manuals to be updated will be identified in Ship Alteration (SHIPALT) Authorization Letters. Activities concerned should review SHIPALT Authorization Letters and advise the SPM of manuals meeting the criteria identified in Table C-I believed to require updating because of actual or planned accomplishment of SHIPALTs and not specifically identified for updating.

When, at any time, a Type I TM is known or suspected to be deficient, the deficiencies should be immediately brought to the attention of NSDSA for initiation of corrective action, in accordance with NAVSEAINST 4160.3.

TMs will be prepared and updated in accordance with NAVSEAINST 4160.3 and the Military Specification used for original preparation.

C.3.2.3.7 Index of Technical Publications (ITP). The ITP is a guide to facilitate the identification of TMs used onboard a ship. The ITP is tailored to the configuration of a specific ship. It lists TMs needed to operate, maintain, and repair a ship's systems and equipment. It also lists any other general and ship related TMs needed by the crew.

The ITP is produced from the Technical Documentation Management Information System (TDMIS), NAVSEA's automated technical manual management information system. TDMIS is operated and maintained by NSDSA. Requests for copies of the ITP should be forwarded to NSDSA with a copy of the request provided to the Type Commander (TYCOM).

For SSN 21 Class, SSN 688 Class and SSN 774 Class submarines, the ITP lists all technical publications related to the operation and maintenance of onboard equipment. It does not include Defense Communications Material Systems (DCMS) equipment TMs, nor does it include tactical, administrative, medical, supply or training publications. The ITP includes the effective changes and revisions of each publication with the exception of Reactor Plant Manuals. Specific onboard allowances can be found in the "Hull Applicability-Quantity Required" lines. The ITP shall include an introduction describing the contents and instructions on its use. Inquiries concerning requests for copies of ITP reports should be made to NSDSA. At 30 days prior to Fast Cruise, the PY shall provide the ship a copy of the preliminary ITP. At EOA+3 the PY shall provide the ship with a final ITP updated to reflect the ship's post-availability configuration. For a more detailed discussion of the ITP refer to Section 8 of this manual.

C.3.2.3.8 Ship Drawing Index (SDI) and Modified Ship Drawing Index (MSDI). The SDI and MSDI are lists of ship's drawing and related design reference information compiled in accordance with Section 085 of NAVSEA S9AA0-AB-GOS-010 General Specifications for Overhaul of Surface Ships and recorded on NAVSHIPS Forms 9020/17 and 9029/19 as shown in Figure 4 of OPNAVINST 4790.4. SDIs or portions thereof prepared in Automated Data Processing (ADP) format are to be considered as part of the Master SDI. Submarine SDIs shall be maintained in accordance with NAVSEA 0902-LP-018-2010.

A MSDI has been supplied to some ships not originally intended to receive a standard SDI. The MSDI lists only the title, NAVSEA drawing and numbers of applicable drawings revisions. For the purpose of this manual, the terms SDI and MSDI are synonymous.

- a. **SDI Content.** The SDI is a listing of all drawings applicable to the ship including Reactor Plant drawings (see C.3.2.3.8.f.). Working drawings, systems diagrams, SRDs having a NAVSEA drawing number assigned, all manufacturing equipment drawings designated as certification data sheets, equipment drawing lists, and assembly drawings which list detail drawings shall be included in the SDI. Alteration drawing numbers, SHIPALT Number, NAVSEA drawing numbers of drawings used to prove systems and/or equipment installed or otherwise affected by the overhaul, will be included. Alteration drawings will not be listed until after the alteration has been accomplished.
- b. **Updating the SDI.** The updated SDI will be provided by the PY to the NSA for correction to reflect subsequent changes through the availability. Since the SDI is the

sole source of identification of all drawings applicable to a ship, the NSA and the PY will ensure that all applicable drawings are included in the SDI. Corrections may be made by typewritten mark-up of the SDI pages and/or appropriate correction to SDIs in ADP format. Ships, or other activities updating the SDI during an availability, other than a regular overhaul, will mark-up the appropriate page(s) of the ship's SDI. A marked-up "Ship's Master Copy" of the SDI will be forwarded to the PY with a request for correction and appropriate distribution. Particular attention shall be directed to ensuring the accomplishment and verification of SDI corrections required as a result of equipment and configuration changes accomplished during restricted availabilities, tender availabilities and voyage repairs. The NSAs are responsible for furnishing all new drawing identification arising from work other than authorized SHIPALTs, such as vendor drawings for items or material installed as part of the ship availability repair packages. The NSA will mark-up the copy of the SDI to indicate the EOA configuration and deliver it to the PY by EOA. The updated SDI will be returned to the ship within 60 days of receipt.

- c. **Arrangement and Status of SDI Data.** (Not applicable to Part II of nuclear powered surface ship, SSN 637/Maintenance Trainer System (MTS) and AS Tenders with nuclear support facility SDI see C.3.2.3.8.f.). The SDI shall have a TM number assigned in accordance with Section 086 of NAVSEA S9AA0-AB-GOS-010 General Specifications for Overhaul of Surface Ships. Revision control shall be in accordance with NAVSEA S0000-00-IDX-000/TMINS. The title page shall indicate the name of the ship and the hull number. Each page of the SDI shall contain the hull number to which it applies, in accordance with MIL-M-38761/2. Pages of the SDI shall be numbered consecutively. All drawings having the same "S" group or 3-digit Consolidated Index Group (NAVSEA 0902-LP-002-2000) Number of NAVSHIPS 0900-LP-002-2000, as applicable, shall be listed on one or more sheets as necessary, grouped by subject matter and listed consecutively. Where more than one page is required in order to add new drawings under a particular group, the supplemental pages shall be numbered the same as the original page, followed by an alphabetical suffix (e.g., 42a, 42b, 42c, etc.). A notation shall be made at the bottom of each page which has been revised, indicating the revision number and date of revision. Each page of the original SDI shall be stamped "ORIGINAL" in green ink. The SDI shall be marked-up to clearly indicate which drawings are SRDs. SDIs that have not been marked-up in the above manner are to be appropriately annotated by PY prior to the providing to the NSA for the next scheduled availability.
- d. **Superseding or Modifying Existing Drawings in the SDI.** When existing drawings applicable to a ship are superseded by new drawings; or are no longer applicable to the ship, the listing of the cancelled or superseded drawing should be lined out, but not obliterated or rendered illegible. The number of the superseding drawings should be entered in the last column of the SDI, in line with the lined out or superseded drawing. When existing drawings applicable to a ship are modified by new drawings, the new drawings shall be listed in the last column in the SDI in line with the modified existing drawings. For ADP prepared SDIs superseded or cancelled drawings are to be listed in an addendum at the end of SDI.
- e. **Conversion and Update of SDIs to ADP Format.** For those ships having SDI in ADP

format, the PY will provide a copy of the SDI in ADP format (access database on CD) to the NSA for correction to reflect changes required to the SDI resulting from work accomplished during the availability, and changes previously accomplished and identified by Ship's Force. After EOA, the corrected SDI will be returned to the PY. Between availabilities, the PY will correct the SDI to reflect changes reported by the ship or other activities when changes are accomplished between availabilities. For those ships not having SDI in ADP format, the NSA will, as directed by the SPM, prepare the SDI in ADP format. Upon completion of the availability, the NSA will transfer the SDI in the new ADP format to the PY. The NSA will also provide a copy of the SDI in ADP format (usually magnetic tape) to the NAVSEA Microfilm Repository, Portsmouth Naval Shipyard.

- f. **Special SDI Requirements for Nuclear-Powered Ships.** Requirements relative to Nuclear-Powered Ships SDI are contained in Section 4 of this manual. For Nuclear Powered Surface Ships, SSN 637 Class submarines, and tenders with nuclear support facilities, the SDI is two parts:
1. **Part I - Non-Reactor Plant SDI:** Lists all drawings except Reactor Plant systems drawings which are in Part II. In particular, Part I of the SDI does include Reactor Plant Equipment vendor drawings. Part I of the SDI is maintained by the Hull PY.
 2. **Part II - Reactor Plant Supplement to the SDI (Cumulative Booklet):** Lists all Reactor Plant systems drawings. Part II of the SDI is maintained by the Reactor Plant PY in accordance with Section 4 of this manual.

C.3.2.3.9 **Submarine Safety Certification Boundary (SSCB) Book.** The SSCB identifies, in diagrammatic form, the boundaries of material certification as delineated in NAVSEA 0924-LP-062-0010. The SSCB shall be the single source document which identifies all the material certification boundaries for a submarine.

C.3.2.3.10 **Ship Service Motors and Controllers Manual (SSMC).** SSMC manuals provide descriptions, troubleshooting procedures, technical data, and scheduled and corrective maintenance procedures for all ship service motors and controllers.

C.3.2.3.11 **Ship Valves Technical Manual (SVTM).** The SVTM provides descriptive and maintenance-related information on all labeled non-Reactor Plant valves and selected small piping system components installed in the ship. The associated User Information Manual provides consolidated index cross-reference data to allow the user to locate valves in the SVTM.

C.3.2.3.12 **Combat System Technical Operations Manual (CSTOM).** CSTOM TMs will be updated by NSWC, Code 4B00 (non-AEGIS), or Code 4C00 (AEGIS), in response to direct funding by the cognizant SPM. NSAs do not have responsibility for CSTOM maintenance.

C.3.2.3.13 **Propulsion Plant Manuals (for 1200 PSI ships).** The NSA is responsible for updating and forwarding preliminary change data to Naval Surface Warfare Center, Carderock Division-Ship Systems Engineering Station (NSWCCD-SSSES), who will issue the final change to the Propulsion Plant Manual.

C.3.2.3.14 **Engineering Operational Sequencing System (EOSS).** NSWCCD-SSES is responsible for maintaining EOSS documentation under the direction of NAVSEA 04M. EOSS is the single authoritative source of operational and casualty control information relative to surface ship engineering plant operation. EOSS is updated to reflect SHIPALT configuration changes to propulsion and support equipments and systems. EOSS includes Engineering Operational Procedures (EOPs), Engineering Operational Casualty Control (EOCC), and operational procedures for selected support systems.

C.3.2.3.15 **Combat System Alignment Manual (CSAM).** CSAM TMs will be updated by NSWCC, Code 4B00, in response to direct funding by the cognizant SPM. NSAs do not have responsibility for CSAM maintenance.

C.3.2.3.16 **Combat System Operational Sequencing System (CSOSS).** NSWCC Dahlgren is responsible for maintaining CSOSS documentation under the direction of NAVSEA 05 for non-AEGIS ships and NAVSEA PMS400 for AEGIS ships. NSAs do not have responsibility for CSOSS maintenance.

C.3.2.3.17 **Aviation Fuel Operational Sequencing System (AFOSS).** The AFOSS documentation will be updated by NSWCCD-SSES in response to tasking by the SPM. PYs and NSAs do not have responsibility for AFOSS development or maintenance.

C.3.2.3.18 **Cargo Fuel Operational Sequencing System (CFOSS).** The CFOSS documentation will be updated by NSWCCD-SSES in response to tasking by the SPM. PYs and NSAs do not have responsibility for CFOSS development or maintenance.

C.3.2.3.19 **Fuel Operational Sequencing System (FOSS).** The FOSS documentation will be updated by NSWCCD-SSES in response to tasking by the SPM. PYs and NSAs do not have responsibility for FOSS development or maintenance.

C.3.2.3.20 **Sewage Disposal Operational Sequencing System (SDOSS).** The SDOSS documentation will be updated by NSWCCD-SSES in response to tasking by the SPM. PYs and NSAs do not have responsibility for SDOSS development or maintenance.

C.3.2.3.21 **Ballasting Operational Sequencing Systems (BOSS).** The BOSS documentation will be updated by NAVSSES in response to tasking by the NAVSEA SPM. PYs and NSAs/IAs do not have responsibility for BOSS development or maintenance.

C.3.2.3.22 **Catapult Operational Sequencing System (CATOSS).** The CATOSS documentation will be updated by NAVSSES 9431 in response to tasking by the NAVSEA SPM. PYs and NSAs/IAs do not have responsibility for CATOSS development or maintenance.

C.3.2.3.23 **Weapons Elevator Operational Procedures System (WEOPS).** The WEOPS documentation will be updated by NAVSEA 05L4 in response to tasking by the NAVSEA SPM. PYs and NSAs/IAs do not have responsibility for WEOPS development or maintenance.

C.3.2.3.24 **Auxiliary Operational Sequencing System (AUXOSS).** The AUXOSS

documentation will be updated by NSWCCD-SSES in response to tasking by the NAVSEA SPM. PYs and NSAs/IAs do not have responsibility for AUXOSS development or maintenance

C.3.2.4 Inactive Ship Selected Record Data Preparation. When inactive ships are being reactivated for assignment to the active fleet, the SSRs listed in Table C-I are to be corrected by the activity performing the activation. Such corrections will be a proper charge against Activation Funds.

C.3.2.5 Funding and Expenditures. Corrections to Planned Maintenance System (PMS) documentation required in accordance with OPNAVINST 4790.4 are not chargeable to DSA. When inactive ships are being reactivated for assignment to the active fleet, the Selected Record Data listed in Table C-I are to be corrected or prepared as appropriate by the activity performing the activation. Such corrections will be a proper charge against Activation Funds.

C.3.3 ALLOWANCE LISTS

C.3.3.1 General. The Shipboard Non-Tactical ADP Program (SNAP) contains the ship's configuration, allowance and onboard inventories in computerized form. The Coordinated Shipboard Allowance List (COSAL) is based upon information contained in the Weapon Systems File (WSF) and maintained and published by Naval Inventory Control Point-Mechanicsburg (NAVICP-M). Within the COSAL, all repair parts and equipage for individual components are listed in Allowance Parts Lists (APLs) or Allowance Equipage Lists (AELs). The quantity of each repair part and/or equipage item authorized to be carried onboard is determined by a computation for each item listed in the Stock Number Sequence List (SNSL). The computed quantities meet the operational endurance requirements specified by OPNAVINST 4441.12 for the type of ship involved.

The publication of an updated COSAL for ships undergoing availabilities is authorized by the TYCOM. Since automated ships maintain all Maintenance and Material Management (3-M) requirements, ships inventory and requisitioning functions in the SNAP database, the COSAL is considered a backup document required in case of catastrophic computer failure.

Ship's configuration records are maintained ashore by the Ship Configuration and Logistics Support Information System (SCLSIS) in accordance with Technical Specification 9090-700. Because configuration determines logistics and allowance support, there is a direct correlation between the data in the configuration database and the data in the WSF and the COSAL. A more detailed description of SCLSIS and the relationship of SCLSIS with the Fleet Modernization Program (FMP) are found in Technical Specification 9090-700, and Section 8 of this manual. During a ship's availability, the SPM may authorize the performance a logistics review to ensure that only the appropriate logistics support is onboard by EOA. These reviews are known as Integrated Logistics Overhauls (ILOs) or Integrated Logistics Reviews (ILRs). The procedures for conducting an ILO/ILR are addressed in NAVSEA SL105-AA-PRO-010 through 070 series. One of the products of an ILO/ILR review is an updated SNAP database. An availability that involves a full ILO produces an updated SNAP database and an updated COSAL.

During the operating cycle, the SNAP database is updated once a month by way of an electronic transmission from NAVICP-M to the ship. However, a new COSAL is published only during

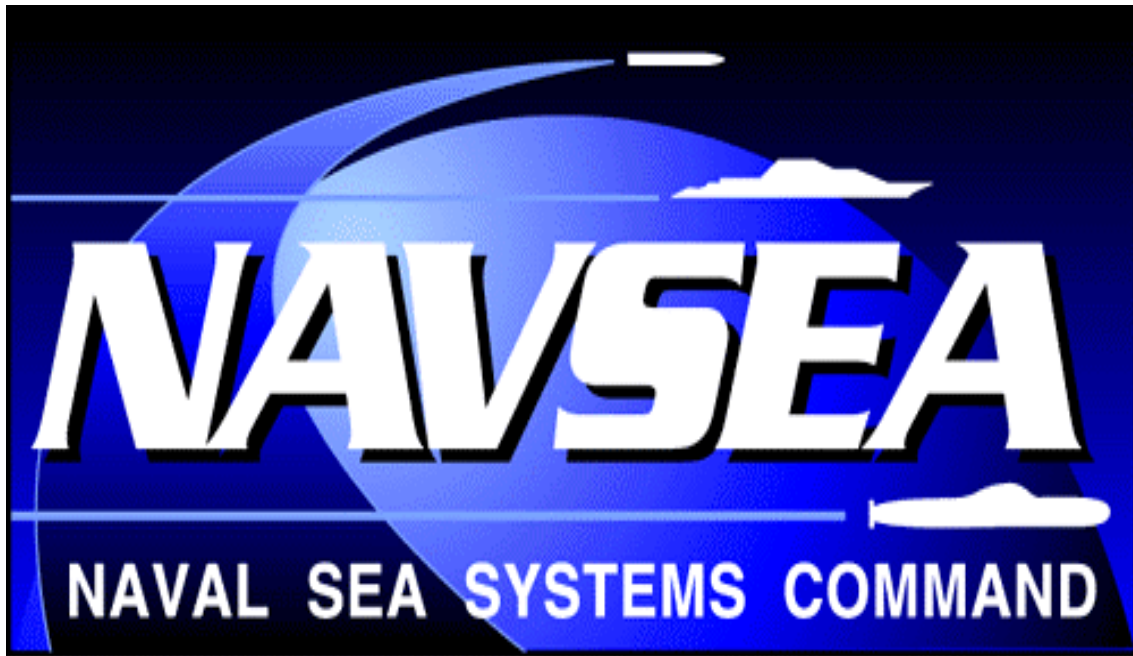
selected availabilities and only at the direction of the TYCOM.

The SPM is responsible for tasking and funding the PY to perform Configuration Overhaul Planning (COP). COP represents the genesis of configuration record changes that are planned to be made during a ship's availability. COP is submitted to the ship's Configuration Data Manager (CDM). The CDM uses the planning data as a tool for the quality review of its database, as a data feed to the NSA and ILO site and as a baseline from which the ILO site begins their reviews. COP must not be viewed as a primarily logistics support effort. Proper preparation of COP allows timely Configuration Management. Proper logistics support is directly dependent upon that management. Responsibilities and timeframes for generating COP are addressed in Section 8 of this manual.

The NSA has the responsibility for updating the COSAL. However, this effort is accomplished by the direct interface with the CDM and the ILO site doing the logistics review (refer to OPNAVINST 4441.12, NAVSEA SL105-AA-PRO-010 through 070 series, and Section 8 of this manual).

C.3.3.2 COSAL/Configuration Efforts Not Covered Under DSA. The following COSAL maintenance efforts are not authorized under DSA funding.

- a. Support of the supply availability material processing points (Shipyard Supply Department, Fleet and Industrial Supply Center (FISC), etc.), which include material handling, necessary supervision, technical assistance, packaging and re-preservation, transportation/per diem, and other necessary material costs (normally Naval Supply Systems Command ((NAVSUP) funded).
- b. Shipboard configuration validation assistance services, for installations other than those planned for or installed as part of the overhaul or availability (incident to Title "K", "K-P", "D", or "F" SHIPALT installation). However, a sample of 10 percent of the Configuration Change Forms (CCFs) submitted by the ILO Teams will be validated by the NSA. If the results of the validation of the CCFs do not comply with MIL-STD-105, then follow-on validation of samples, in accordance with MIL-STD-105 will be chargeable to the appropriate TYCOM.



APPENDIX G

ALTERATION FUNCTIONAL IDENTIFICATION NUMBERS

APPENDIX G
ALTERATION FUNCTIONAL IDENTIFICATION NUMBERS

TABLE 1
ALTERATION FUNCTIONAL IDENTIFICATION NUMBERS (ALTFIN, NS)

FUNCTIONAL AREA - FIRST THREE DIGITS

CODE	FUNCTIONAL AREA
<u>100</u>	<u>AAW-GENERAL</u> (including ASMD, SMS, BPD, SMS, For C3 see 400)
101	ASMD
110	AAW SENSORS
111	AIR SEARCH RADARS (REVERT)
112	IFF AIMS
120	CV-TSC
130	AAW ELECTRONIC WARFARE/DECEPTION
131	ACTIVE ECM, CHAFF, FLARES, ECCM, ETC.
132	PASSIVE ECM
140	AAW WEAPONS
141	SURFACE TO AIR MISSILE SYSTEMS
142	GUN SYSTEMS
150	AAW SPECIAL PROGRAM
151	CIWIS
152	DESIGN TO PRICE EW
<u>200</u>	<u>ASW-GENERAL</u>
210	ASW SENSORS-GENERAL
211	SONAR - HULL MOUNTED
212	OTHER SONAR-VDS, TASS, ETC.
213	BQQ-5
214	SQS-23
230	ASW WEAPONS-GENERAL
231	SUBROC SYSTEMS
232	ASROC SYSTEMS
233	ASW TORPEDOES
250	ASW SPECIAL PROGRAMS
251	MK 48 TORPEDO
252	LAMPS

APPENDIX G
ALTERATION FUNCTIONAL IDENTIFICATION NUMBERS
TABLE 1 (Continued)

300	<u>OTHER WARFARE AREAS-GENERAL</u>
301-309	GENERAL SENSORS (SURFACE SEARCH RADARS, ETC.)
310	SURFACE WARFARE GENERAL
311	SURVIVABILITY
315	MAJOR CLIBER GUN SYSTEMS
320	ANTI-SHIP MISSILE SYSTEMS
321	NATO SEA SPARROW
322	HARPOON
330	SHIP CONTROL-GENERAL
331	NAVIGATION ELECTRONIC (LORAN, OMEGA, ETC.)
332	NAVIGATION INERTIAL/GYRO (SINS, ETC.)
340	SUBMARINE WARFARE
341	TYPE 18 PERISCOPE
350	MINE WARFARE
351	SENSORS (SONAR, TV, ETC.)
352	MINE LAYING
353	MINE DESTRUCTION (SEEP, MAGNETIC, ACOUSTIC, ETC.)
360	AMPHIBIOUS WARFARE-GENERAL
361	AMPHIBIOUS BOATS, DAVITS, ETC.
370	STRATEGIC WARFARE SYSTEMS
380	SPECIAL PROGRAM
381	NIXIE
400	<u>COMMAND & CONTROL-GENERAL</u>
402	DATA LINKS
405	SECURITY-GENERAL
406	SECURE VOICE
410	SATCOM
450	SPECIAL PROGRAMS-GENERAL
451	IACS
452	TACS/TADS
453	NAVMACS
454	MUTE

APPENDIX G
ALTERATION FUNCTIONAL IDENTIFICATION NUMBERS
TABLE 1 (Continued)

500	AVIATION SUPPORT-GENERAL (For LAMPS see ASE Code 200)
511	AIRCRAFT HANDLING CATAPULTS (ARRESTING GEAR, ETC.)
512	JET BLAST DEFLECTORS
515	AIRCRAFT SUPPORT, SHOPS, ETC.-GENERAL
516	SUPPORT: F14/A3A/ECL
517	SUPPORT: A7E/A6E/BA6B
520	AIRCRAFT WEAPONS HANDLING/STORAGE-GENERAL
530	LANDING SYSTEMS-GENERAL
531	ACLS
532	VISUAL AIDS
550	SPECIAL PROGRAMS
551	VAST
600	COMBAT LOGISTIC SUPPORT-GENERAL
610	UNREP
650	SPECIAL PROGRAMS
700	HULL, MECHANICAL, ELECTRICAL -GENERAL
710	HULL/MACHINERY-GENERAL
711	WEIGHT, MOMENT, BALLAST, ETC.
712	PROPULSION MACHINERY-GENERAL
713	GAS TURBINES
714	STEAM PLANT IMPROVMENTS
715	AUXILIARY MACHINERY
716	TENDERS/REPAIR SHIP FACILITIES
717	GROUND TACKLE, WINDLASS, ETC.
718	BOATS, DAVITS, ETC.
720	ELECTRICAL-GENERAL
721	SHIPS' SERVICE POWER
722	AUXILIARY POWER
730	FIREFIGHTING-GENERAL
731	AFFF
732	HALON
740	OUTFITTING AND FURNISHING
750	SPECIAL PROGRAMS

APPENDIX G
ALTERATION FUNCTIONAL IDENTIFICATION NUMBERS
TABLE 1 (Continued)

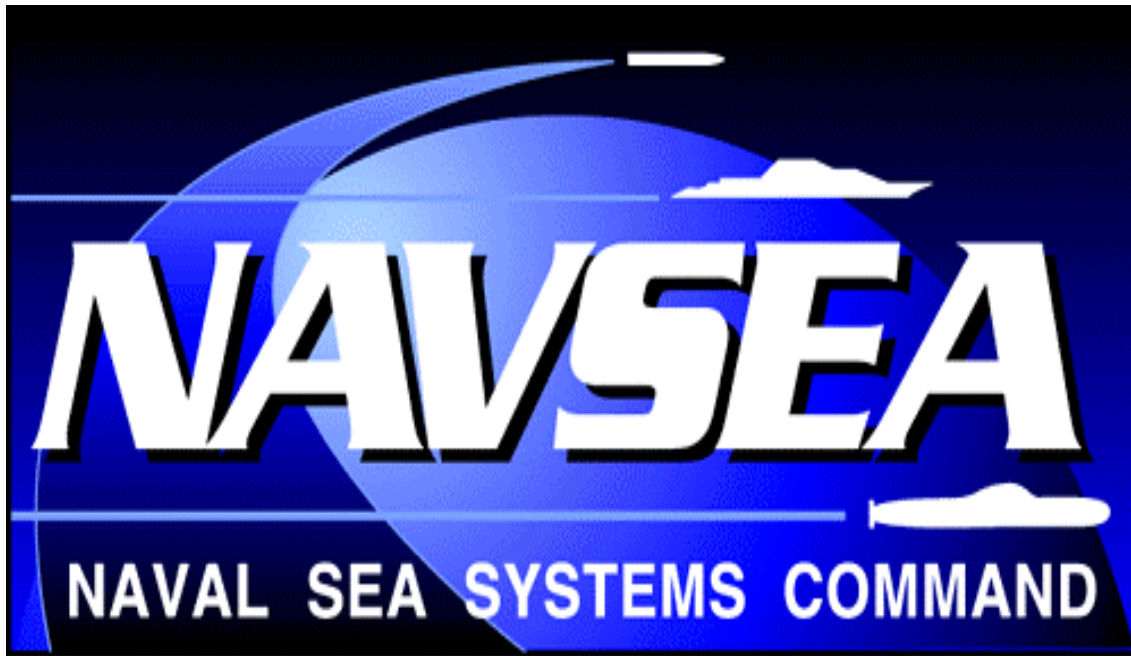
800	<u>PERSONNEL/LOGISTIC SUPPORT-GENERAL</u>
810	HABITABILITY
811	HABITABILITY FOR LIVING/BERTHING
812	HABITABILITY FOR SANITARY
813	HABITABILITY FOR MESSING AND FOOD SERVICE
814	HABITABILITY FOR LAUNDRY
815	HABITABILITY FOR MISCELLANEOUS
820	MEDICAL/DENTAL FACILITIES
830	FLAG FACILITIES
840	LOGISTICS IMPROVEMENTS, SUPPLY (EXCEPT CARGO, ETC.)
850	SPECIAL PROGRAMS
900	<u>SPECIAL IMPROVEMENTS (Includes Directed Programs)</u>
910	TASK LIGHTS
920	POLLUTION ABATEMENT (LESS CHT)
921	POLLUTION ABATEMENT (CHT)

APPENDIX G

TABLE 1
ALTERATION FUNCTIONAL IDENTIFICATION NUMBERS (ALTFIN, NS)

PURPOSE CODES - LAST TWO DIGITS

CODE	MEANING
<u>01-05</u>	<u>SAFETY</u>
01	SHIP/SYSTEM/EQUIPMENT
02	PERSONNEL
03	GENERAL SUBSAFE
04	
<u>06-10</u>	<u>MAINTAINABILITY/RELIABILITY</u>
07	DART
<u>50-60</u>	<u>CAPABILITY</u>
50	IMPROVED CAPABILITY
51	NEW CAPABILITY
52	HABITABILITY
<u>61-70</u>	<u>SPECIAL PURPOSE</u>
61	POLLUTION ABATEMENT (GENERAL)
62	SERVICE FLIFE EXTENSION
<u>80-89</u>	<u>SURVIVABILITY</u>
80	FIREFIGHTING ACTIVE
81	FIREFIGHTING PASSIVE
82	DAMAGE CONTROL
83	SHOCK
84	FRAGMENTATION
85	NUCLEAR HARDENING EMP
86	NUCLEAR HARDENING BALST
87	MAGAZINE PROTECTION
88	CHEMICAL/BIOLOGICAL WARFARE
89	SURVIVABILITY MISCELLANEOUS



**APPENDIX H
SHIP ALTERATION RECORD (SAR)
ALTERATION MATERIAL LIST (AML)
PREPARATION GUIDE**

APPENDIX H

SHIP ALTERATION RECORD (SAR) ALTERATION MATERIAL LIST (AML) PREPARATION GUIDE

1. Scope. This guide is intended to clarify/supplement guidance available for SAR AML preparation (reference (a)) and shall be used for all SARs prepared. In addition, this guide provides guidelines for quality assurance of SAR AML data. Exhibit (1) identifies source codes and Exhibit (2) provides Unit of Issue definitions. Per Chief of Naval Operations (CNO) direction to ensure effectiveness of Modernization efforts, all must adhere to established policies to provide new equipment only when proper support is in place. Less than full adherence to Integrated Logistics Support (ILS) and Life Cycle Management policies results in reduced reliability, maintainability, and readiness.

2. References.

- a. Appendix A, Subj: NAVSEA Technical Specification 9090-500c, Ship Alteration Preparation
- b. Defense Integrated Data System (DIDS) Procedures Manual (DOD 4100.39-M). Volume 10, Chapter 4, Table 53

3. General Guidance. Material items that should be included in the SAR AML are:

- All Centrally Provided Material (CPM) including Headquarters CPM (HCPM), non-standard material, material with design unique to the Ship Alteration (SHIPALT), material of unusual quantity, high dollar value items (\$15,000 or more), material with a history of procurement problems, Long Lead Time Material (LLTM) (Material considered to have a high probability of not being obtainable in a timeframe greater than six months per subparagraph 7-2.2.2 of Volume 1 of this manual), all Logistically Significant Material (LSM) (requires development of new/revised logistics (Provisioning Technical Documentation (PTD), Allowance Parts List (APL), Training, Planned Maintenance System (PMS), Technical Manuals, Test Equipment)), and Level 1 Submarine Safety (SUBSAFE) material. CPM items not to be included are On Board Repair Parts (OBRPs) and anything readily available from shop stores or tender load lists, or that can be locally purchased (e.g., piping, bolts, fasteners, outfitting material, standard material plates).
- Material to be discussed in the SAR text should be included in the SAR AML. All NAVSEA Data Environment – Navy Modernization (NDE-NM) (formerly FMPMIS) should be included.
- If no NDE-NM material is required, add a statement similar to the following on the SAR AML page: "ALL INCIDENTAL MATERIALS REQUIRED FOR THIS SHIPALT TO BE PROVIDED BY THE NSA/IA."

4. For Each Item on the AML:

- Assign a separate "Item Number" for each material item beginning with "1" and list in numerical order.
- Different items to be procured together as a system, assembly or kit shall also have a single item number with the words "CONSISTING OF" and alpha-numeric sub-

numbering included in the material item identification area.

5. Procuring Activity Column.

- The SAR developer should enter the procuring activity into the "Procuring Activity" column on the SAR AML (e.g., "Defense Logistics Agency (DLA)").
- Procuring activity is defined cognizant inventory manager purchasing material that is dependent on SHIPALT requirements in NDE-NM (e.g., Acquisition Manager (NAVSEA 93), Life Cycle Manager (NAVSEA 03), Naval Inventory Control Point – Mechanicsburg (NAVICP-M), DLA). See Exhibit (1).

6. Description.

- For standard stock material, provide the following information on the SAR AML:
 - Noun name and technical characteristics, including type, size, capacity, shock requirements, etc.
 - Military Specification (MILSPEC)/Military Standard (MILSTD)/Standard Drawing (STD DWG), etc. with all applicable options identified.
 - National Stock Number (NSN) or Navy Item Control Number (NICN) including cognizance code.
- For non-standard material, provide the following ordering data information on the SAR AML:
 - MILSPEC/MILSTD.
 - Manufacturer's name and Commercial and Government Entity (CAGE) number.
 - Manufacturer's model or part number.
 - Manufacturer's drawing or piece number.
 - Navy Standard Drawing or piece number.
 - Standard ordering data per paragraph 6.1/6.2 of the applicable MILSPEC.
 - Physical characteristics.
- To help reduce costs to the Navy, every effort should be made to utilize existing standard stock material. Utilization of Navy supported equipment or components which are identified in the Hull, Mechanical and Electrical (HM&E) Equipment Data Research System (HEDRS) should be considered first.

7. Unit of Issue. The unit of issue for each item on the SAR AML must match the unit of issue code as specified in Exhibit (2). Unit of issue codes and definitions contained in Exhibit (2) are in accordance with reference (b).

8. Quantity Required (Per Ship). Identify quantities required. If uncertain, identify the largest quantity that may be needed.

9. Applicable ship(s). The Ship Program Manager (SPM) has final authority over the SHIPALT but will notify PYs of changes made during their final review.

COGNIZANT ACTIVITY LISTING**COG/ROUTING
IDENTIFIER****COGNIZANT ACTIVITY**

OA Q11	Field Command/DNA (Defense Nuclear Agency)
OE N23	NAVSEA (Naval Sea Systems Command)
OI R92	NAVICP-P Phila., PA
OJ N35	NAVICP-M Mechanicsburg, PA
OK N36	CNET (Chief of Naval Education and Training)
OL N77	SPAWAR/ NAVICP-M (Space and Naval Warfare Systems Command/Naval Inventory Control Point - Philadelphia)
OM N35	NAVICP-M Mechanicsburg, PA
ON R41	Civil Engineering Support Office
OO N35	NAVICP-M Mechanicsburg, PA
OQ N32	NAVICP-P Philadelphia, PA
OR N32	NAVICP-P Philadelphia, PA
OS N35	NAVICP-M Mechanicsburg, PA
OT MHQ	CMC (Commandant of the Marine Corps)
OU N35	NAVICP-M Mechanicsburg, PA
OV PPZ	NAVAIR (Naval Air Systems Command)
OX Q6D	DCMS (Defense Communications Material Systems)
1B N22	NAVSUP (Naval Supply Systems Command)
1H N35	NAVICP-M Mechanicsburg, PA
1I R92	NAVICP-M Mechanicsburg, PA
1Q Q27	NRSO (Naval Resale and Service Support Office)
1R N32	NAVICP-P Philadelphia, PA
1V N47	FMSO (Fleet Material Support Office)
1X N47	FMSO (Fleet Material Support Office)
2B N325	NAVICP-M Mechanicsburg, PA
2C R41	Civil Engineering Support Office in lieu of NAVFAC
2D Q81	Joint Cruise Missile Project Office
2E NCB	NAVICP-M Mechanicsburg, PA
2F N23	NAVSEA (Naval Sea Systems Command)

**COG/ROUTING
IDENTIFIER****COGNIZANT ACTIVITY**

2J N23	NAVSEA (Naval Sea Systems Command)
2L Q6D	DCMS (Defense Communications Material Systems)
2M N21	NAVAIR (Naval Air Systems Command)
2O N45	NTSC (Navy Training Support Center)
2P RCZ	NAVPRO (SPG), Pittsfield, MA (SPG)
2Q N35	NAVAIR/ NAVICP-M Mechanicsburg, PA (Naval Air Systems Command/ Naval Inventory Control Point - Philadelphia)
2S N23	NAVSEA (Naval Sea Systems Command)
2T NCB	NAVICP-M Mechanicsburg, PA
2V N21	NAVAIR (Naval Air Systems Command)
2W N21	NAVAIR (Naval Air Systems Command)
2X RAZ	NAVPRO (SPL-60), Sunnyvale, CA
2Z N77	SPAWAR (Space and Naval Warfare Systems Command)
3H N35	NAVICP-M Mechanicsburg, PA
4E NCB	NAVICP-M Mechanicsburg, PA
4K N21	NAVAIR (Naval Air Systems Command)
4M N77	SPAWAR (Space and Naval Warfare Systems Command)
4P R31	NAVPRO (SPL (W)), Sunnyvale, CA
4R N32	NAVICP-P Philadelphia, PA
4T NCB	NAVICP-M Mechanicsburg, PA
4V N21	NAVAIR (Naval Air Systems Command)
4X RKZ	NAVPLANTTECHREP (SPI), Anaheim, CA
4Y N35	NAVICP-M Mechanicsburg, PA
4Z N32	NAVICP-P Philadelphia, PA
5L B56	Army Communications Security Logistics Agency
5M B46	Army Security Agency
5N FPD	San Antonio Air Logistics Center, Kelly AFB, TX
5P FPZ	San Antonio Air Logistics Center, Kelly AFB, TX
5R N32	NAVICP-P Philadelphia, PA
6A N35	NAVICP-M Mechanicsburg, PA
6B N35	NAVICP-M Mechanicsburg, PA

**COG/ROUTING
IDENTIFIER****COGNIZANT ACTIVITY**

6C N35	NAVICP-M Mechanicsburg, PA
6D N35	NAVICP-M Mechanicsburg, PA
6H N35	NAVICP-M Mechanicsburg, PA
6K N32	NAVICP-P Philadelphia, PA
6L N35	NAVICP-M Mechanicsburg, PA
6M N35	NAVICP-M Mechanicsburg, PA
6P RAZ	NAVPRO (SPL-60), Sunnyvale, CA
6R N32	NAVICP-P Philadelphia, PA
6T N79	NMEF (Naval Mine Engineering Facility)
6V N52	NALC (Naval Aviation Logistics Center)
6X N35	NAVICP-M Mechanicsburg, PA
6Y N35	NAVICP-M Mechanicsburg, PA
7E N35	NAVICP-M Mechanicsburg, PA
7G N35	NAVICP-M Mechanicsburg, PA
7H N35	NAVICP-M Mechanicsburg, PA
7N N35	NAVICP-M Mechanicsburg, PA
7R N32	NAVICP-P Philadelphia, PA
7Z N35	NAVICP-M Mechanicsburg, PA
8A N21	NAVAIR/NAVSEA (Naval Air Systems Command/Naval Sea Systems Command)
8E N21	NAVAIR (Naval Air Systems Command)
8M N21	NAVAIR (Naval Air Systems Command)
8N N32	NAVICP-P Philadelphia, PA
8P R29	NAVPLANTECHREP, Sperry, Great Neck, NY
8S N24	NAVSEA (Naval Sea Systems Command)
8T N24	NAVSEA (Naval Sea Systems Command)
8U NCB	NAVICP-M Mechanicsburg, PA
8X R33	NAVPLANTECHREPO (SPA), Anaheim, CA
9A AKZ	ATAC (Army Tank-Automotive Command)
9C S9C	DSCC (Defense Supply Center Columbus)
9D S9T	DSCP (Defense Supply Center Philadelphia)

**COG/ROUTING
IDENTIFIER****COGNIZANT ACTIVITY**

9E B17	Army Troop Support Command
9F FLZ	Warner-Robins Air Logistics Center, Robins AFB, GA
9G S9G	DSCR (Defense Supply Center Richmond)
9H B14	Army Armament Command
9I FGZ	Ogden Air Logistics Center, Hill AFB, UT
9J FHZ	Oklahoma Air Logistics Center, Tinker AFB, OK
9K FFZ	Sacramento Air Logistics Center, McClellan AFB, CA
9L S9M	DSCP (Defense Supply Center Philadelphia)
9M S9S	DSCP (Defense Supply Center Philadelphia)
9N S9E	DSCC (Defense Supply Center Columbus)
9O MAB	Marine Corps Logistics Base, Atlantic, Albany, GA
9P G13	National Weather Service
9Q GSA	Appropriate General Services Administration (GSA) Regional Office
9S B64	Army Missile Command, Redstone Arsenal, AL
9T G69	Federal Aviation Administration
9V FPZ	San Antonio Air Logistics Center, Kelly AFB, TX
9W B17	Army Troop Support and Aviation Material Readiness Command
9X S9F	DESC (Defense Energy Support Center)
9Y B16	U. S. Army Electronics Command
9Z S91	DISC (Defense Industrial Supply Center)

UNIT OF ISSUE CODES

Note: Those terms preceded by an asterisk (*) require a quantitative expression.

CODE	TERM	DEFINITION
<u>A</u>		
AM	*Ampoule	A small glass or plastic tube sealed by fusion after filling
AT	Assortment	A collection of a variety of items that fall into a category or class packaged as a small unit constituting a single item of supply. Use only when the term "assortment" is a part of the item name.
AY	Assembly	A collection of parts assembled to form a complete unit, constituting a single item of supply, e. g., hose assembly. Use only when the term "assembly" is part of the item name.
<u>B</u>		
BA	*Ball	A spherical-shaped mass of material such as twine or thread
BD	*Bundle	A quantity of the same item tied together without compression.
BE	*Bale	A shaped unit of compressible materials bound with cord or metal ties and usually wrapped, e. g., paper and cloth rags.
BF	Board Foot	A unit of measure for lumber equal to the volume of a board 12" X 12" X 1"
BG	*Bag	A flexible container of various sizes and shapes which is fabricated from such materials as paper, plastic or textiles. Includes "sack" and "pouch".
BK	*Book	A book-like package, such as labels or tickets, fastened together along one edge, usually between protective covers.
BL	*Barrel	A cylindrical container, metal or wood, with sides that bulge outward and flat ends or heads of equal diameter. Includes "keg".
BO	*Bolt	A flat fold of fabric having a stiff paperboard core.
BR	*Bar	A solid piece or block of various materials, with its length greater than its other dimensions, e. g., solder. Not applicable to items such as soap, beeswax, buffing compound.
BT	*Bottle	A glass plastic or earthenware container of various sizes, shapes and finishes such as jugs but excluding jars, ampoules, vials and carboys, with a closure for retention of contents.
BX	*Box	A rigid, three-dimensional container of various sizes and material. Includes "case", "carton", "tray", and "crate".
<u>C</u>		
CA	*Cartridge	Usually a tubular receptacle containing loose or pliable material and designed to permit ready insertion into an apparatus for dispensing the material. Usually associated with adhesives and sealing compounds.

CODE	TERM	DEFINITION
CB	*Carboy	A heavy duty, bottle-like container used for transportation and storage of liquids. Usually designed to be encased in a rigid protective outer container for shipment.
CD	Cubic Yard	A unit of cubic measure.
CE	*Cone	A cone-shaped mass of material wound on itself such as twine or thread, wound on a conical core.
CF	Cubic Foot	A unit of cubic measure.
CK	*Cake	A block of compacted or congealed matter. Applicable to such items as soap, buffing compound.
CL	*Coil	An arrangement of material such as wire, rope and tubing wound in a circular shape.
CN	*Can	A rigid receptacle made of fiber, metal, plastic or a combination thereof. Cans may be cylindrical or any number of irregular shapes. Restricted to items which cannot be issued in less than container quantity. Includes "pail" and "canister". Do not use when the packaged quantity equates to a unit of measure, i. e., pint, quart, gallon, ounce, pound.
CO	*Container	A general term for use only when an item is permitted to be packaged for issue in optional containers, e. g., bottle or tube for a single National Stock Number.
CS	Case	A box or receptacle for holding items. Intra-Navy use only for 9M cognizance items.
CT	Carton	A cardboard box or container. Intra-Navy use only for 9M cognizance items.
CY	*Cylinder	A rigid, cylindrical, metal container designed as a portable container for storage and transportation of compressed gasses, generally equipped with protective valve closure and pressure relief safety device.
CZ	Cubic Meter	A unit of cubic measure expressed in the metric system of measurement. Limited in application to locally assigned stock numbers used in the local procurement of items such as ready-mix concrete and asphalt in oversea areas where the metric system prevails.
<u>D</u>		
DR	*Drum	A cylindrical container designed as an exterior pack for storing and shipping bulk materials, e. g., fuels, chemicals, powders, etc. Drums may be made of metal, rubber, polyethylene or plywood, or fiber with wooden, metal or fiber ends.
<u>E</u>		
EA	Each	A numeric quantity of one item of supply. Do not use if a more specific term applies, such as kit, set, assortment, assembly, group, sheet, plate, strip or length.

CODE	TERM	DEFINITION
<u>F</u>		
FT	Foot	Unit of linear measurement, sometimes expressed as "linear foot".
FV	Five	Five of an item.
FY	Fifty	Fifty of an item
<u>G</u>		
GL	Gallon	Unit of liquid measurement.
GP	Group	A collection of related items issued as a single item of supply, e. g., test set group. Use only when the term "group" is part of the item name.
GR	Gross	One hundred forty-four (144) of an item.
<u>H</u>		
HD	Hundred	One hundred (100) of an item.
HK	*Hank	A loop of yarn or roping, containing definite yardage, e. g., cotton, 840 yards; worsted, 560 yards. See "skein" for comparison.
<u>I</u>		
IN	Inch	Unit of linear measurement, equivalent to 1/12 of a foot and sometimes expressed as "linear inch".
<u>J</u>		
JR	*Jar	A rigid container having a wide mouth and often no neck, typically made of earthenware or glass. Excludes "bottle".
<u>K</u>		
KT	Kit	A collection of related items issued as a single item of supply, such as the tools, instruments, repair parts, instruction sheets and often supplies typically carried in a box or bag. Also includes selected collections of equipment components, tools, and/or materials for the repair, overhaul, or modification of equipment. Use only when the term "kit" is a part of the item name.
<u>L</u>		
LB	Pound	A unit of weight measure equivalent to 16 ounces.
LG	*Length	Term applies to items issued in fixed or specific linear measurement, without deviation. This term no longer applies to random lengths which will be expressed in definitive units of linear measure such as foot or yard. Excludes "strip".
LI	Liter	A unit of liquid measure expressed in the metric system of measurement.
<u>M</u>		
MC	Thousand Cubic Feet	A unit of cubic measure expressed in one thousand (1,000) increments.

CODE	TERM	DEFINITION
MR	Meter	A unit of linear measure expressed in the metric system of measurement, equivalent to 39.37 inches. Limited in application to locally assigned stock numbers used in the local procurement of items such as pipe, lumber, tubing and hose in oversea areas where the metric system prevails.
MX	Thousand	One thousand (1,000) of an item.
<u>O</u>		
OT	Outfit	A collection of related items issued as a single item of supply, such as the tools, instruments, materials, equipment, and/or instruction manual(s) for the practice of a trade or profession or for carrying out a particular project or function. Use only when the term "outfit" is a part of the item name.
OZ	Ounce	A unit of liquid or avoirdupois weight.
<u>P</u>		
PD	*Pad	Multiple sheets of paper that are stacked together and fastened at one end by sealing.
PG	*Package	A form of protective wrapping for two or more of an item of supply. To be used only when a unit of measure or container type term is not applicable. Includes "envelope".
PK	Pack	A group or pile of related items. Intra-Navy use only for 9M cognizance items.
PR	Pair	Two similar corresponding items, e. g., gloves, shoes, bearings; or items integrally fabricated of two corresponding parts, e. g., trousers, shears, goggles.
PT	Pint	A unit of liquid or dry measure.
PZ	*Packet	A container used for subsistence items. Use only when "food packet" is part of the item name (Federal Supply Group [FSG] 89).
<u>Q</u>		
QT	Quart	A unit of liquid or dry measure.
<u>R</u>		
RA	Ration	The food allowance of one person for one day. Use only when "ration" (FSC 8970) is part of the item name.
RL	*Reel	A cylindrical core on which a flexible material, such as wire or cable, is wound. Usually has flanged ends.
RM	Ream	A quantity of paper varying from 480 to 516 sheets, depending on grade.
RO	*Roll	A cylindrical configuration of flexible material which has been rolled on itself such as textiles, tape, abrasive paper, photosensitive paper and film, and may utilize a core with or without flanges.
<u>S</u>		
SD	*Skid	A pallet-like Platform consisting of a load-bearing area fastened to

CODE	TERM	DEFINITION
		and resting on runner type supports.
SE	Set	A collection of matched or related items issued as a single item of supply, i. e., tool sets, instrument sets, and matched sets. Use Only when the term "set" is a part of the item name.
SH	Sheet	A flat piece of rectangular-shaped material of uniform thickness that is very thin in relation to its length and width, such as metal, plastic, paper, and plywood. Use of this term is not limited to any group of items or FSCs. However, it will always be applied when "sheet" is used in the item name to denote shape, e. g., aluminum alloy sheet, except items in FSC 7210.
SK	Skein	A loop of yarn 120 yards in length, usually wound on a 54-inch circular core. See "hank" for comparison.
SL	*Spool	A cylindrical form with an edge or rim at each end and an axial hole for a pin or spindle on which a flexible material such as thread or wire is wound.
SO	Shot	A unit of linear measurement, usually applied to anchor chain; equivalent to 15 fathoms (90 ft).
SP	*Strip	A relatively narrow, flat length of material, uniform in width, such as paper, wood, and metal. Use only when the term "strip" is part of the item name.
SX	*Stick	Material in a relatively long and slender, often cylindrical form for ease of application or use, e. g., abrasives.
SY	Square Yard	A unit of square measure (area).
<u>T</u>		
TI	Tin	A box, can, pan, vessel, or sheet made of tinplate.
TN	Ton	The equivalent of 2,000 lbs. Includes short ton and net ton.
TO	Troy Ounce	A unit of troy weight measure, based on 12 ounce pound, generally applied to weights of precious metals.
TU	*Tube	Normally a squeeze-type container, most commonly manufactured from a flexible type material and used in packaging toothpaste, shaving cream and pharmaceutical products. Also applicable as form around which items are wound, such as thread. It is not applicable to mailing tube, pneumatic tube, or cylindrical containers of a similar type.
<u>V</u>		
VI	*Vial	A small glass container, generally less than an inch in diameter. Vials are flat-bottomed and tubular in shape and have a variety of neck finishes.
<u>Y</u>		
YD	Yard	A unit of linear measure, equivalent to 3 feet and sometimes expressed as "linear yard".